RSALOP

Radionuclide Soil Action Levels Oversight Panel

Peer Review Team

Compiled by:

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1998/1999

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Rocky Flats Citizens Advisory Board

An Advisory Board to the U.S. Department of Energy

Rocky Flats Soil Action Levels Project

Peer Review Panel Selection Process

Resumes of Candidates

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12/98

Rocky Flats Soil Action Level Oversight Panel
Peer Review
Reviewer Selection
-Resumes-

- **Steven L. Simon, Ph.D.**
- **Dr. D. Warner North**
- **William J. Bair, Ph.D.**
- **Arjun Makhijani, Ph.D.**
- **Bernd Franke**
- **Lynn R. Anspaugh, Ph.D.**
- **Allan C. B. Richardson**
- **Dr. F. Ward Whicker**
- **F. Owen Hoffman, Ph.D.**
- **Glenn Paulson, Ph.D.**
- **Paula A. Labieniec, Ph.D.**

Steven L. Simon, Ph.D.

Biographical Sketch

STEVEN L. SIMON is a senior staff officer with the Board on Radiation Effects Research at the National Academy of Sciences, National Research Council. He has been with the National Academy of Sciences for 2 years.

Dr. Simon received his bachelor and master's degrees in physics from the University of Texas and his doctorate from Colorado State University in radiological health sciences. His specialties include measurement of ionizing radiation, in particular, in-situ gamma spectrometry and dosimetry/dose reconstruction. His present interests include evaluation of environmental contamination and related exposures (past and present), exposure-pathway analysis—particularly for non-traditional populations, the evaluation of radiation risk including quantitative uncertainty analysis, and radiation-related health effects.

Dr. Simon previously held positions as medical radiaiton dosimetrist for the University of New Mexico Cancer Research and Treatment Center, assistant professor of Radiological Hygiene at the University of North Carolina-Chapel Hill (School of Public Health), and was director of the first comprehensive radiological monitoring program of the Marshall Islands (Marshall Islands Nationwide Radiological Study) from 1990 through mid-1995. He has conducted dosimetry evaluations in support of radioepidemiologic studies of thyroid disease and leukemia in Utah and directed a large radiation-related thyroid-disease study in the Marshall Islands. He has participated in a variety of radiological monitoring and assessments related to nuclear testing at sites worldwide including the Nevada Test Site, Marshall Islands, Mururoa-French Polynesia, and Semipalatinsk, Khazakstan and has conducted radiological monitoring in Sri Lanka on behalf of the International Atomic Energy Agency.

In addition to his current full-time position at the National Academy of Sciences, Dr. Simon is an adjunct faculty member in the Department of Radiological Health Sciences at Colorado State University and holds an affiliate associate professor position at Baylor College of Medicine. He is an Associate Editor of *Health Physics* and a member of the Health Physics Society, Society of Risk Analysis, Sigma Xi, and the International Union of Radioecologists. Dr. Simon has published numerous papers on evaluations of radiation doses to various populations and on measurements of radioactivity in the environment, in particular, of soil contamination.

STEVEN L. SIMON, Ph.D.
CURRICULUM VITAE

PERSONAL INFORMATION

Present busines address:

Board on Radiation Effects Research
National Academy of Sciences
2101 Constitution Ave., NW
Washington, DC USA 20418

ph: 1-202-334-2232 (general office)
ph: 1-202-334-1245 (direct)
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email: ssimon@nas.edu

Permanent home address:

[redacted]

EDUCATION

Undergraduate: B.S. Science Education, University of Texas at Austin ([redacted])
B.S. Physics, University of Texas at Austin ([redacted]

Graduate: M.S. Radiological Physics*, University of Texas Health Sciences Center at Dallas ([redacted]
Ph.D. Radiological Health Sciences**, Colorado State University ([redacted]

*radiation medical physics
**environmental radiation and assessment/statistical analysis

TEACHING EXPERIENCE

Earned B.S. Degree in Science Education, University of Texas at Austin, 1973.

Graduate Teaching Assistant, University of Texas at Arlington, Department of Physics, undergraduate physics laboratory, 1975-76.

Graduate Teaching Assistant, Colorado State University, Department of Radiology and Radiation Biology, graduate level health physics, 1980-81.

Assistant Professor, University of North Carolina, Chapel Hill, NC, School of Public Health, Department of Environmental Sciences and Engineering, December 1986 to December 1990.
Teaching responsibilities:
Radiation Instrumentation (graduate level),
Elements of Health Physics (upper level undergraduate and graduate),

Environmental Radioactivity (graduate level),
Medical Physics Instruction Coordinator (graduate level),
Supervised graduate level research.

Instructor: Determining Uncertainties in Environmental Assessments, Health Physics Society, Summer School on Environmental Dose and Risk Assessment, Santa Fe, NM, June, 1989.

Guest lectures at: Marshall Islands High School (Majuro, Marshall Islands, 1994)
College of Micronesia (1991, 1994) - Majuro, Marshall Islands
University of Massachusetts (1993) - Amherst, MA
U.S. Peace Corps (1993,1994, 1995) - Majuro, Marshall Islands
Colorado State University (1992, 1993, 1994, 1998) - Ft. Collins, CO

Affiliate faculty member (currently), Department of Radiological Health Sciences, Colorado State University, Ft. Collins, CO, appointed 1 July 1993.

Adjunct Associate Professor (currently), Department of Cancer Control and Research, Baylor College of Medicine, Houston, TX, appointed 1997.

FELLOWSHIPS, AWARDS AND INTERNSHIPS

Planetary Biology Internship (co-sponsored by National Aeronautics and Space Administration and Boston University), NASA Ames Research Center, Moffet Field, CA, summer, 1980.

Mining and Mineral Resource Center Fellowship, Colorado School of Mines to Colorado State University, 1981-82.

Health Physics Society Student Travel Grant Award to Annual Meeting, Baltimore, MD, 1983.

Mined Land Reclamation Dissertation Award, Environmental Resources Center, Colorado State University, 1985.

SOCIETY MEMBERSHIPS: Health Physics Society (HPS)
Sigma Xi Research Society
Risk Analysis Society (RSA)
International Union of Radioecologists (IUR)

RESEARCH INTERESTS AND GENERAL EXPERTISE: (1) Radiation dosimetry, exposure and risk assessment, (2) Environmental monitoring (particularly *in situ* gamma spectrometry) and sampling design, (3) Environmental transport processes and exposure pathways, (4) radioactivity in man, (5) Health effects of radiation exposure, (6) Computer assessment modeling, uncertainty analysis and statistical data analysis, (7) Culture/ethnic-specific parameters for risk assessments to special or unusual populations.

PRESENTATIONS: (available on request).

CURRENT AND PAST RESEARCH POSITIONS

Graduate Research Assistant. 1975-1977. Department of Radiological Physics, University of Texas Health Science Center at Dallas. Subtraction X-ray imaging to enhance iodine contrast in clinical radiography.

Research Medical Physicist. 1977-1979. University of New Mexico Cancer Research And Treatment Center - based at Los Alamos National Laboratory/Meson Facility. Responsible for patient treatment planning dosimetry for Pi-Meson radiation therapy clinical trials.

Graduate Research Assistant. 1980. Los Alamos National Laboratory. Theoretical Biophysics Group (T-10). Computer management for DNA Sequence Library.

Planetary Biology Intern. Summer, 1980. NASA Ames Research Center, Moffet Field, CA. Computer programmer for sampling designs of environmental data for NASA LANDSAT satellite imaging program.

Graduate Research Assistant. 1982-1985. Radioecology Group, Department of Radiology and Radiation Biology, Colorado State University. Studied uptake and kinetic behavior of uranium progeny in range land vegetation.

Post-Doctoral Researcher. Summer 1985. Radioecology Group, Department of Radiology and Radiation Biology, Colorado State University. Statistical data analysis of contaminant dispersion at uranium mining site.

Research Associate. 1986. Department of Epidemiology, University of Utah, Salt Lake City, UT. Developmental work on methods for dose assessment and uncertainty/sensitivity analysis for radiation health effects studies in Utah - Leukemia Case Control Study and Thyroid Cohort Study.

Assistant Professor, University of North Carolina, School of Public Health. December 1986 through 1990. Subcontract with the University of Utah (Radioactive Fallout Epidemiology Study) for developmental work on dose assessment methodology and uncertainty/sensitivity analysis for exposure to atomic weapons test fallout.

Visiting Scientist, Environmental Sciences Division, Lawrence Livermore National Laboratory. Summer 1989. Developed dose assessment methodology and uncertainty analysis for environmental radiation dose assessments.

Director - Marshall Islands Nationwide Radiological Study (Nov. 1989 - September 1995):
(a) Director of laboratory and field studies for nationwide radiological monitoring program (employee of Government of Republic of Marshall Islands). Responsibility to direct studies funded under Compact of Free Association (an international agreement with the U.S.). Position included designing and overseeing construction of radiological analysis laboratory,

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directing a comprehensive, environmental radiological measurement and sampling program for 29 atolls; and for providing radiation dose and risk assessments using data acquired in study. Acted as sole scientist in residence to provide guidance to the Government of the Republic of the Marshall Islands and Nuclear Claims Tribunal on radiological health and environmental radiation issues. Directed laboratory staff of 11 persons.

(b) Principal Investigator for Marshall Islands Nationwide Thyroid Disease Study, employing 14 persons (concurrently as Director of laboratory). Phase I, II funded by Marshall Islands Government (1993-1995). Study examined over 7,200 Marshallese for thyroid disease. Development of thyroid dosimetry (in progress).

(c) Member of Scientific Management Team for the U.S. Congressional funded Rongelap Resettlement Project. Responsibilities include acting as Principal Investigator for (1) radiological monitoring and laboratory analysis of the environment of Rongelap Atoll, (2) determining compliance with dose limit for future residents and for environmental contamination of transuranic radionuclides, and (3) studies of microdistribution of plutonium in soil from Rongelap. Also, co-investigator to provide guidance and recommendations for remediation of Rongelap Atoll.

January 1996-present: Owner of Global Risk Assessment Services: private consulant in environmental radioactivity measurement, dosimetry and risk assessment. Owner of Track Couning Services - a service providing computerized counting of nuclear particle tracks in emulsions, polymers, etc.

February 1997-present: Senior Staff Officer, Board on Radiation Effects Research, National Academy of Sciences, National Research Council, Washington, DC. Responsibilities are to direct large committee based scientific studies. Present responsibilities are Study Director for: (1) a risk assessment of radon in drinking water, committee of twelve, (2) a review of guidelines for naturally occurring radioactive materials, committtee of seven, (3) review of National Cancer Institute report on ^{131}I exposure of the American people from Nevada nuclear tests, committee of eighteen. Assisted with study on Battlefield Radiation Exposure Criteria.

GRANTS AND RESEARCH FUNDING

"Dose Assessment and Uncertainty Analysis for Utah Thyroid Cohort Study", year: 1988. Funding: $39,000. Location: University of North Carolina. Awarded from: University of Utah. Position: Principal (single) Investigator.

"Marshall Islands Nationwide Radiological Study", year: 1990-1995. Funding: $3,000,000. Location: Republic of the Marshall Islands. Position: Principal Investigator.

"Scientific Studies for Rongelap Resettlement Project" year: 1992-1995. Funding: $683,000 (part of a $1,600,000 award). Funded by: U.S. Department of the Interior. Position: Principal Investigator (and member of the Scientific Management Team).

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"Epidemiologic Evaluation of Thyroid Disease and Exposure to Radioactive Fallout." 1994-1995. Funding: $350,000. Awarded from: U.S. Centers for Disease Control. Position: Principal Investigator.

SELECTED PROFESSIONAL SERVICES

Peer reviewer for *Journal of Environmental Radioactivity*, Elsevier Applied Science Publishers.

Peer reviewer for *Health Physics* journal, Pergamon Press.

Peer reviewer for *Canadian Journal of Soil Science.*

Peer reviewer for *Journal of Environmental Quality.*

Invited participant in National Environmental Management Workshop, Majuro, Republic of the Marshall Islands, October 9-11, 1991.

Invited member of Panel on Environmental Exposure Assessment at the Workshop on Energy-Related Epidemiologic Research Agenda, held by the Centers for Disease Control and the Agency for Toxic Substances and Disease Registry, 3-4 December, 1991, Atlanta, GA.

NCRP (National Council on Radiation Protection and Measurements). Member of Scientific Committee 84-1, December 1991-present. Objectives: determine acceptable radionuclide contamination levels for soil.

Invited member of Panel to Review Uncertainty/Sensitivity Plans for the Hanford Environmental Dose Reconstruction Project - 24 & 25, May, 1993.

ASSOCIATE EDITOR – *Health Physics* journal, beginning 1 July, 1993 - present.

Member of ANSI N13.33 Working Group, Contributor to "Guide for preparation of Environmental Radiation Surveillance and Monitoring Reports", July, 1993 - 1998.

Special Editor of *Health Physics* issue on "Consequences of Nuclear Testing in the Marshall Islands" 73(1), 1997.

Environmental Protection Agency, member of Uncertainty in Radiogenic Risk Subcommittee of Radiation Avisory Committee of Science Advisory Board (SAB), 1987-1998.

Co-editor of special issue of *Environment International* to honor the career of Merril Eisenbud. In progress (1998).

SELECTED CONSULTING

Science Advisory Board of the Environmental Protection Agency (EPA):

(i) Sources and Transport Subcommittee, 1988: Participated in review of technical basis of the radionuclide National Emission Standards for Hazardous Air Pollutants (NESHAP).

(ii) Radiation Advisory Committee, 1989: Review of Background Information Documents for radionuclide NESHAP.

State of North Carolina, Low Level Radioactive Waste Management Authority. Reviewed the Nuclear Regulatory Commission's Environmental Impact Statement on Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste" and prepared report. 1988.

University of Utah Fallout Epidemiological Study for the National Cancer Institute: "Assessment of Leukemia and Thyroid Disease in Relation to Fallout in Utah,": Subcontract with the University of North Carolina, Chapel Hill, 1987-1989.

Centers for Disease Control (CDC): Reviewer/liaison of Hanford Dose Reconstruction Project and then proposed CDC Thyroid Morbidity Study. 1989-1990.

International Atomic Energy Agency (Vienna): Consultant to Division of Radiation and Waste Safety. Duties: served as technical consultant to Bikini Atoll Advisory Group. 11-14 December 1995.

International Atomic Energy Agency (Vienna): Consultant to Division of Radiation and Waste Safety. Duties: wrote draft of report on assessment of the radiological situation and aspects of rehabilitation of Bikini Atoll. 21 January - 14 February 1996.

International Atomic Energy Agency (Vienna): Consultant to Division of Radiation and Waste Safety. Duties: participated as team member to monitor (*in situ* gamma spectrometry) Mururoa and Fangataufa Atolls, French Polynesia. July-August 1996.

International Atomic Energy Agency (Vienna). Consultant. Served as on-site consultant to teach and conduct *in situ* gamma spectrometry at Radioisotope Center, University of Colombo, Colombo, Sri Lanka, December 1997.

International Atomic Energy Agency (Vienna). Consultant on "Characterisation of Radionuclide Species and Aggregates and their Role in Environmental Radioactivity Measurements. December 1999.

PUBLICATIONS

Academic

Simon, S.L. 1977. "Absorption-Edge Subtraction Radiography." Masters Thesis, Department of Radiological Physics, University of Texas Health Sciences Center at Dallas, Texas.

Simon, S.L. 1985. "Uptake and Kinetics of ^{226}Ra, ^{210}Pb and ^{210}Po in Big Sagebrush." Doctoral Dissertation, Department of Radiology and Radiation Biology, Colorado State University, Ft. Collins, CO 80523.

Proceedings etc.

Hogstrom, K. R., A.R. Smith, J.W. Somers, S.L. Simon and C.A. Kelsey. 1978. "In-Vivo Dosimetry for Negative Pion Therapy." American Association of Physicists in Medicine Charged Particle Beam Group Workshop Manual. Los Alamos National Laboratory.

Smith, A.R., K.R. Hogstrom, S.L. Simon, P. Berardo, S. Zink, J. Somers, M.M. Kligerman, and H. Tsujii. 1978. Proceedings of the Third Meeting on Fundamental and Practical Aspects on the Application of Fast Neutrons and Other High LET Particles in Clinical Radiotherapy, The Hague, Sept., 1978. Pergamon Press.

Simon, S.L. 1988. "Uncertainty Analysis and Model Validation for a Retrospective Assessment of Thyroid Dose Resulting from Atomic Weapons' Test Fallout." Proceedings of Workshop on Methods for Assessing the Reliability of Environmental Transfer Models Predictions, Oct. 5-9, 1987. Athens, Greece. Pergamon Press.

Simon, S.L. 1989 "Methods for Determining Uncertainties in Environmental Assessments," Health Physics Society Summer School Manual on Environmental Dose and Risk Assessment, Santa Fe, NM.

Simon, S.L. Written statement published in Oversight Hearing before the Subcommittee on Oversight and Investigations of the Committee on Natural Resources, U.S. House of Representatives, 103rd Congress, 2nd Session on Radiation Exposure from Nuclear Tests in the Pacific, Hearing held in Washington, D.C., 24 February 1994. Serial no. 103-68.

Simon, S.L. "A summary of health, environmental and sociological consequences from atomic testing in the Marshall Islands." Nagasaki Symposium, Radiation and Human Health, S. Nagataki and S. Yamashita (eds.), Elsevier Science B.V., pp. 155-165, 1996.

Fujuimori, K.T. Takahashi, H. Ohtomo, S.L. Simon, K. R. Trott. 1996. "Preliminary medical findings of the Marshall Islands Nationwide Thyroid Study." Nagasaki Symposium, Radiation and Human Health, S. Nagataki and S. Yamashita (eds.), Elsevier Science B.V., pp. 167-174.

Simon, S.L., R.J. Vetter. Guest Editorial: "Editor's Remarks on Consequences of Nuclear Testing in the Marshall Islands." Health Physics 73(1): 3.

Simon, S.L. "New health risk study of radon in drinking water to be conducted by the National Research Council." International Society of Exposure Analysis (ISEA) Newsletter, Summer 1997, pp. 4-5.

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Simon, S.L. (contributor) In Shapiro, C.S., Kiseleve, V.I. Zaitsev, E.V. (eds.) Nuclear Tests: Long-Term Consequences in the Semipalatinks/Altai Region, Proceedings of the NARO Advanced Research Workshop, held in Barnaul, Russia, 5-10 September 1994. SNATO Series, 2. Environment, Vol. 36, New York: Spring-Verlag.

Peer Reviewed Publications

Smith, A.R.; K.R. Hogstrom; S.L. Simon; P. Berardo; S. Zink; J. Somers; M.M. Kligerman; Tsujii. 1979. "Dosimetry and Treatment Planning for Pion Radiotherapy at LAMPF," In High LET Radiations in Clinical Radiotherapy Supplement to the European Journal of Cancer, 233-234.

Hogstrom, K.R.; A.R. Smith; S.L. Simon; J.W. Somers; R.G. Lane; I.I. Rosen; C.A. Kelsey; P.A. Berardo; S.M. Zink. 1979. "Static Pion Beam Treatment Planning of Deep Seated Tumors Using Computerized Tomographic Scans," International Journal of Radiation Oncology, Biology and Physics 5:875-876.

Hogstrom, K.R.; A.R. Smith; J.W. Somers; R. G. Lane; I.I. Rosen; S.L. Simon; C.A. Kelsey. 1979. "Measurements of the Effect of Inhomogeneities and Compensating Bolus in Clinical Pion Beams," Medical Physics 6:26-31.

Simon, S. L.; E.J. Deming. 1986. "Leaching of ^{226}Ra from Leaves and Soil and the Relationship to the Internal Contamination of Plants," Journal of Environmental Quality 15(3):305-308.

Simon, S.L.; L. Fraley, Jr. 1986. "^{226}Ra Uptake by Sagebrush from Uniform and Non-Uniform Soil Amendments," Journal of Environmental and Experimental Botany 26(1):81-88.

Simon, S.L.; L. Fraley, Jr. 1986. "Uptake and Kinetics of Uranium Progeny Injected In-Situ," Journal of Environmental Quality 15(4):345-350.

Simon, S.L.; S.A. Ibrahim. 1987. "The Plant/Soil Concentration Ratio: Evidence for Non-linearity with Reference to Calcium, Radium, Lead and Polonium," Journal of Environmental Radioactivity 5:123-142.

Simon, S.L.; S.A. Ibrahim. 1990. "Biological Uptake of Radium in Terrestrial Plants," In The Environmental Behavior of Radium, Technical Reports Series, No. 310, Vol. 1, International Atomic Energy Agency (IAEA), Vienna, 1990, pp. 545-597.

Lloyd, R.; D.C. Gren; S.L. Simon; M.E. Wrenn; H.A. Hawthorne; W. Stevens; J. Till; T. Lotz. 1990. "Assigning Individual Exposures from Nevada Test Site Fallout for Utah Leukemia Cases and Controls," Health Physics 59(5):723-737.

Hamrick, P.E.; B.E. Wall; S.L. Simon. 1990. "Incineration and Monitoring of Low Level Sulfur-35 Wastes at a Biological Research Institution." Health Physics 57(1):191-194.

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Ibrahim, S.A.; F.W. Whicker; S.L. Simon. 1990. "Ground Distribution Patterns of Selected Radioactive, Chemical and Physical Contaminants From Dispersion of U Mill Tailings." Health Physics 58(3): 321-328.

Simon, S L. 1990. "An Analysis of Vegetation Interception Data Pertaining to Close-In Weapons Test Fallout," Health Physics 59(5):619-626.

Simon S.L.; R.D. Lloyd; J.E. Till; H.A. Hawthorne; D.C. Gren; M. Rallison; W. Stevens. 1990. "Development of a Method to Estimate Dose from Fallout Radioiodine to Persons in a Thyroid Cohort Study," Health Physics 59(5):669-691.

Stevens, W.; D.C. Thomas; J.L. Lyon; J.E. Till; R. Kerber; S.L. Simon; R.D. Lloyd; S. Preston-Martin. 1990. "Leukemia in Utah and Radioactive Fallout from the Nevada Test Site - A Case-Control Study." Journal of the American Medical Association (JAMA) 264(5):585-591.

Simon, S. L.; A. B. Barron; J. C. Graham; S. Duffy. 1993. "An Overview of the Marshall Islands Nationwide Radiological Study." 1993. Proceedings of the Twenty-Sixth Midyear Topical Meeting of the Health Physics Society, 24-28 January, 1993, R. L. Kathren, D. H. Denham and K. Salmon, Editors. Research Enterprises Publishing Segment.

Kerber, R.A.; J.E. Till; S.L. Simon; J.L. Lyon; D.C. Thomas; S. Preston- Martin; M.L. Rallison; R.D. Lloyd; W. Stevens. 1993. "A Cohort Study of Thyroid Disease in Relation to Fallout from Nuclear Testing." Journal of the American Medical Association (JAMA), 270(17):2076-2082.

Till, J.E.; S.L. Simon; R. A. Kerber; R.D. Lloyd; W. Stevens; D. C. Thomas; J.L. Lyon; S. Preston-Martin. 1995. "The Utah Thyroid Study: Analysis of the Dosimetry Results." Health Physics 68(4):472-483.

Simon, S.L.; J.E. Till; R.D. Lloyd; R.L. Kerber; D.C. Thomas; S. Preston-Martin; J. L. Lyon; W. Stevens. 1995. "The Utah Leukemia Case-Control Study: Dosimetry Methodology and Results." Health Physics 68(4):460-471.

Simon, S.L.; T. Jenner; J.C. Graham; A. Borchert. 1995. "A Comparison of Macro- and Microscopic Measurements of Plutonium in Contaminated Soil from the Republic of the Marshall Islands." Journal of Radioanalytical and Nuclear Chemistry 194(1): 197-205.

Simon, S.L. 1995. "Prediction of Inhaled Thorium." Correspondence (Letter to the Editor). Health Physics 69(2):283-284.

Graham, J.C.; S.L. Simon. 1996. "A Study of ^{137}Cs in Soil Profiles from the Marshall Islands", Science and the Total Environment 183: 255-268.

Simon, S.L.; J.C. Graham. 1996. "Dose Assessment Activities in the Republic of the Marshall Islands." Health Physics 71(4):438-456.

Simon, S.L. 1997. "A Brief History of People and Events Related to Atomic Weapons Testing in the Marshall Islands." Health Physics 73(1):5-20.

Diggle, P.; L. Harper, L.; S.L. Simon. 1997. "Geostatistical Analysis of Residual Contamination From Nuclear Weapons Testing." Statistics for the Environment 3: Pollution Assessment and Control. pp. 89-107 (Proceedings of SPRUCE: Statistics in Public Resources, Utilities and in Care of the Environment. Proceedings from 11-15 December 1995, Merida, Mexico.)

Simon, S.L.; J.C. Graham. 1997. Findings of the First Comprehensive Radiological Monitoring Program of the Republic of the Marshall Islands." Health Physics 73(1):66-85.

Simon, S.L.; W.L. Robison. 1997. "A Compilation of Atomic Weapons' Test Detonation Data for U.S. Pacific Ocean tests." Health Physics 73(1):258-264.

Simon, S.L.; W.L. Robison; M.C. Thorne; L.H. Toburen; B. Franke; K.F. Baverstock; H.J. Pettingill. 1997. "A Comparision of Independently Conduced Dose Assessments to Determine Compliance and Resettlement Options for the People of Rongelap Atoll." Health Physics 73(1):133-151.

Takahashi, T.; K.R. Trott; K. Fujimori; S.L. Simon; H. Otomo; N. Nakashima; K. Takaya; N. Kimura; T. Konno; S. Satomi, M. Shoemaker 1997. "An Investigations Into the Prevalence of Thyroid Nodules and Thyroid Cancer on Kwajalein Atoll, Marshall Islands." Health Physics 73(1):199-213.

McEwan, A.C.; S.L. Simon; K.F. Baverstock; K.R. Trott; K. Sankaranaryanan; H.G. Paretzke. 1997. "Some Reflections On the Role of the Scientific Advisory Panel to the Marshall Islands Nationwide Radiological Study." Health Physics 73(1):265-269.

Hoffman, F.O., S.L. Simon, K.M. Thiessen. 1997. "The Role of Uncertainty Analysis in Dose Reconstruction and Risk Assessment." Proceedings of the National Council on Radiation Protection and Measurements, 31st Annual Meeting, Arlington, VA, April 1995.

Simon, S.L. 1998. "Soil ingestion by humans: a review of data, history, and etiology with application to risk assessment of radioactively contaminated soil." Health Physics 74(6):647-672.

Simon, S.L.; J.C. Graham. 1998. "A comparison of aerial and ground level spectrometry measurements of ^{137}Cs in the Marshall Islands." *In press*, Environmental Monitoring and Assessment - An International Journal.

Duffy, S., Simon, S.L., Whicker, F.W. "^{137}Cs contamination of plants used for traditional medicine and implications for human exposure. " *Accepted* for publicaton in Journal of Environmental Radioactivity.

Simon, S.L. "Uncertainty in the University of Utah's Nevada Test Site Studies." *Accepted* for publication, Journal of the National Cancer Institute.

Takahashi, T. Fujimori, K., Simon, S.L., Bechtner, G., Edwards, R., Trott, K.R. Thyroid nodules, thyroid function and dietary iodine in the Marshall Islands. *Accepted* for publication in International Journal of Epidemiology. 1998.

Reports

Simon, S.L. and Till, J.E. 1987-1988. "A Handbook of Some Statistical Methods for Environmental Measurements." Produced for the Savannah River Plant.

Simon, S.L. 1988. "Low Level Radioactive Waste Management - A Summary of the NRC Environmental Impact Statement Issued November, 1982." Prepared for the State of North Carolina, Low-Level Radioactive Waste Management Authority, Raleigh, NC.

Simon, S.L. 1988. "A Radiological Assessment for the Use of Coal Fly Ash in Wallboard Building Materials." Prepared for Health & Hygiene, Inc., 7815 National Service Road, Greensboro, NC.

(multi-author) "National Emission Standards for Hazardous Air Pollutants (NESHAP): Standards for Radionuclides - Review of Assessment Methodologies", 1988. Science Advisory Board, Sources and Transport Subcommittee of the Radiation Advisory Committee, U.S. EPA, Washington, D.C.

Stevens, W., J.E. Till, J.L. Lyon, D.C. Thomas, R.A. Kerber, S. Preston-Martin, R.D. Lloyd and S.L. Simon. "FINAL REPORT - A Case-Control Study of Leukemia Deaths in Utah (1952-1981) and Exposure to Radioactive Fallout from the Nevada Test Site (1952-1958)", NCI Contract #NO1-CO-23917, School of Medicine, University of Utah, Salt Lake City, UT.

Stevens, W., J.E. Till, J.L. Lyon, D.C. Thomas, R.A. Kerber, S. Preston-Martin, R.D. Lloyd and S.L. Simon. July, 1992. "FINAL REPORT - A Cohort Study of Thyroid Disease and Radioactive Fallout from the Nevada Test Site" - National Cancer Institute Contract #NO1-CO-23917, School of Medicine, University of Utah.

Hoffman, F. O., W. J. Conover, M. Henrion, E. Hofer, S. L. Simon. 1993. "Peer Review of HEDR Uncertainty and Sensitivity Analyses Plan - Hanford Environmental Dose Reconstruction Project." Prepared for Battelle, Pacific Northwest Laboratories. PNWD-2162 HEDR, UC-000.

Baverstock, K.F.; B. Franke and S.L. Simon (in alaphabetical order). "Rongelap Resettlement Project, Summary of First Phase: Determining Compliance with Agreed Limits for Total Dose-Rate on Rongelap Island and Actinide Contamination of Soils on Rongelap Island and Neighbouring Islands." April 1994. Submitted to U.S. House Appropriations Committee on

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Insular Affairs, 5 May 1994. Available from: Rongelap Resettlement Project, P.O. Box 1766, Majuro, Marshall Islands.

Simon, S.L., Trott, K. R., Fujimori, K., Takahashi, T., Ohtomo, H. and Kimura, N. "Report on the Medical Findings of the Thyroid Disease Study in Ebeye, Marshall Islands - 1993", submitted to the Nitijela (Parliament) of the Government of the Republic of the Marshall Islands, June 1993. Available from the Ministry of Health and Environment, Government of the Republic of the Marshall Islands, Majuro, Republic of the Marshall Islands.

Simon, S.L. and J.C. Graham. 1994. "Findings of the Nationwide Radiological Study: Summary Report", submitted to the Cabinet of the Government of the Republic of the Marshall Islands. December 1994. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Simon, S.L. and J.C. Graham. 1994, 1995. "RMI Radiological Survey of Enewetak and Ujelang Atolls", December 1994, revised February 1995. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Simon, S.L. and J.C. Graham. 1995. "RMI Radiological Survey of Ailinginae and Rongerik Atolls", February 1995. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Simon, S.L. and J.C. Graham. 1995. "RMI Radiological Survey of Bikini Atoll", February 1995. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Simon, S.L. and J.C. Graham. 1995. "RMI Radiological Survey of Utrik, Taka, Bikar and Bokak Atolls", February 1995. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Baverstock, K.F.; B. Franke and S. L. Simon (in alphabetical order). May 1995. "Findings of the Rongelap Resettlement Project Scientific Studies." Available from Rongelap Resettlement Project, P.O. Box 1766, Majuro, Marshall Islands.

Simon, S.L. and J.C. Graham. 1995. "RMI Radiological Survey of Northern Rongelap Atoll", June 1995. Available from Ministry of Foreign Affairs, Government of the Republic of the Marshall Islands, Majuro, Marshall Islands, 96960.

Simon, S.L. and J.C. Graham. 1995. "Findings of the Nationwide Radiological Study: Data Tables and Sample Maps, Vols. I, II, III." Available from author.

Contributing author (multi-author). "Screening Levels for Contamined Soils." Bethesda, MD: National Council on Radiological Protection. *In press.*

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Submitted Manuscripts

Simon, S.L.; J.C. Graham; A. Borchert. Concentrations and spatial distribution of plutonium in the Republic of the Marshall Islands. Submitted for publication: *The Science of the Total Environment*. 1998.

Tuttle, R. M., Takahashi, T., Fujimori, K. Trott, K.R., Anderson, J., Djuh, Y.Y., Simon, S.L. Activation rates of RAS and RET/PC in nodular thyroid disease developing in the Marshall Islands. Submitted to *Proceedings of International Symposium on Radiation and Thyroid Cancer*, Cambridge, UK. 1998.

Trott, K.R., Schpoemaker, M.J., Takahashi, T., Fujimor, K. Nakashimā, N. Ohtomo, H., Watanabe, M., Satomi, S., Simon, S.L. Thyroid cancer and thyroid nodules in the people of the Marshall Islands potentially exposed to fallout from nuclear weapons testing. Submitted to *Proceedings of International Symposium on Radiation and Thyroid Cancer*, Cambridge, UK. 1998.

Ibrahim, S.A.; Simon, S.L. Natural radionuclide contents in human whole-body ashes. Submitted to *Journal of Radioanalytical and Nuclear Chemistry*. 1998.

PROFESSIONAL REFERENCES

available on request

Dr. D. Warner North

DR. D. WARNER NORTH, President, NorthWorks, Inc.

SPECIALIZED PROFESSIONAL COMPETENCE

Decision analysis; risk assessment and risk management; research and development planning; public policy analysis; analysis of environmental issues; modeling of complex engineering, economic, and ecological systems.

MAJOR CONSULTING PROJECTS AT DECISION FOCUS (1977-1998)

- **National Science Foundation (NSF), with cosponsorship from major oil and chemical companies.** Principal investigator, case studies on ingested arsenic and dieldrin to illustrate methods for improving carcinogen risk assessment and value of information analysis.

- **U.S. Department of Energy (DOE).** Project supervisor for Decision Focus participation in the Tulane University-led Consortium for Environmental Risk Evaluation Phase I review of risks from the DOE nuclear weapons complex.

- **Government of Mexico.** Project supervisor for analyses on air quality and emissions control issues for the Secretary of Energy, Mines, and State-owned Industry (SEMIP).

- **Electric Power Research Institute (EPRI).** Project leader or supervisor, development and applications of decision frameworks for acid deposition, coal combustion by-products, and ambient air quality standards.

- **Utility Air Regulatory Group (UARG).** Development and presentation of testimony to the EPA Clean Air Scientific Advisory Committee on the health impacts of particulate matter and of sulfur dioxide.

- **Office of Policy Analysis, U. S. Environmental Protection Agency (EPA).** Consultant on risk assessment methodology for major EPA cross-media studies of Santa Clara Valley and Denver.

- **Office of Toxic Substances, EPA.** Project leader, development of methodology to set priorities for testing and selecting regulatory strategy for toxic chemicals.

- **U.S. Department of Energy.** Consultant to the Deputy Assistant Secretary for Oil and Gas Programs on program strategy for enhanced oil recovery programs.

- **American Bar Association, Special Committee on Energy Law.** Consultant to committee for DOE study on state decision making for electric power facilities.

- **Los Alamos Scientific Laboratory.** Principal investigator, decision analysis application to federal R&D strategy on magnetic fusion.

- **Environmental Assessment Department, EPRI.** Project leader, development of a research planning format for EPRI environmental research.

- **Solar Energy Research Institute.** Principal investigator, development of integrating methodology for photovoltaics venture analysis to evaluate DOE commercialization strategy.

- **Major chemical company.** Consultant on regulatory and research strategies for a proprietary agricultural chemical product.

- **Major oil company.** Analysis of environmental and health impacts of a process to make synthetic liquid fuels from coal.

- **Office of Fossil Energy, ERDA.** Project leader for Market Oriented Program Planning Study (MOPPS), a major analytical support effort to assist a federal task force in assessing implications of the potential new twentieth century energy technologies and in recommending appropriate budgetary priorities to ERDA top management.

OTHER PROFESSIONAL EXPERIENCE

- President, Society for Risk Analysis, 1991-2.

- Nuclear Waste Technical Review Board: Member and Chair, Risk and Performance Analysis Panel (1989 - May, 1994)

- Special consultant to the Administrator of the Federal Energy Administration for review of the petroleum price regulation program (1977).

- Invitational Workshop on Ecological Risk Management, sponsored by the Society of Environmental Toxicology and Chemistry (SETAC) Foundation for Environmental Education, Williamsburg, VA (1997)

Science Advisory Board, U.S. Environmental Protection Agency

- Member, Subcommittee on Risk Assessment (1979-1982) and Environmental Health Committee (1982-1990, Vice Chairman 1985-1990).

- Chairman, Panel on Research in Support of Risk Assessment; Member, Carcinogenicity Risk Assessment Guidelines Review Group; Member, Extrapolation Models Review Panel; Member, Integrated Environmental Management Subcommittee; Co-chairman, Acute Toxics Subcommittee; Vice Chairman, Stratospheric Ozone Subcommittee; Vice Chairman, Hazard Ranking System Review Subcommittee (1983-1990).

- Chair, Global Climate Subcommittee (1988-1989).

- Member, Subcommittee on Lead and Subcommittee on Ozone, Clean Air Scientific Advisory Committee (1983-1995).

National Research Council/National Academy of Sciences

- Member, Committee on the Institutional Means for Assessment of Risks to Public Health, (1981-1983).
- Member, Committee on Health and Ecological Effects of Synfuels Industries, (1982-1985).
- Member and Assistant Chairman, Stockpile Assessment Panel, Committee on Demilitarizing Chemical Munitions and Agents, (1983-1984).
- Consultant to the Board on Radioactive Waste Management, review of DOE methodology for high level waste site selection (1985-1986).
- Invited Participant, Workshop on Research Needs in Risk Analysis (June 1986).
- Member, Committee on Risk Perception and Communication (1987-1989).
- Member, Committee on Risk Assessment Methodology (1989-1992).
- Member, Committee on Risk Assessment of Hazardous Air Pollutants (1991-1993).
- Member, Committee on Risk Characterization (1994-1996).
- Member, Board on Radioactive Waste Management (March 1995 - present).
- Chair, Committee to Review Federal Estimates of the Relationship of Vehicle Weight to Fatality and Injury Risk (1996).

State of California

- Member, Scientific Advisory Panel, Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65); Co-Chair, Risk Assessment Subpanel (1987-1989).

MAJOR CONSULTING PROJECTS AT STANFORD RESEARCH INSTITUTE (1967–1977)

- **Division of Fossil Energy, ERDA.** Project leader, establishment of priorities of R&D programs on fossil energy technologies, including coal gasification, synthetic liquids from coal and shale, and advanced fossil fueled electric generation technologies.
- **Jet Propulsion Laboratory and NASA.** Project leader or supervisor of four projects, assessment of probability of biological contamination from interplanetary space missions.
- **Forest Service, U. S. Department of Agriculture.** Project leader or supervisor of five projects, analysis of policy on wildland fire protection, including evaluation of large computer models for fire simulation and resource management.

- **National Science Foundation.** Principal investigator, development of a framework to compare economic, environmental, health, and safety impacts of coal and nuclear electric generation.

- **Office of Management and Budget and Interagency Task Force on Synthetic Fuels Commercialization.** Project supervisor and principal investigator, evaluation of the environmental impacts, cost-benefit analysis of strategic program alternatives, and projections of synthetic fuel supply and demand.

- **National Caries Program, National Institutes of Health.** Project supervisor, analysis of R&D project selection.

- **Department of Defense.** Principal investigator, conceptual design and illustrative application of system for allocating information-gathering resources.

- **National Oceanic and Atmospheric Administration.** Project leader, analysis of U.S. policy on hurricane modification.

- **Private Client.** Consultant to top level corporate task force on major gas turbine product strategy decision, including carrying out market analysis of utility decision to buy product offering.

- **Comision Federal de Electricidad, Government of Mexico.** Analysis of nuclear power and electric capacity expansion decisions; development of electric utility capacity expansion model.

STANFORD UNIVERSITY, DEPARTMENT OF ENGINEERING-ECONOMIC SYSTEMS: CONSULTING ASSOCIATE PROFESSOR (1976–1988), CONSULTING PROFESSOR (1988–present)

- Graduate/upper-level undergraduate seminar on environmental health policy, Biology 155 (co-taught with Donald Kennedy, President Emeritus and Bing Professor of Environmental Studies), (1995,1996).

- Graduate/upper-level undergraduate course, EES&OR 194/294, "The Role of Technology in Public Policy Decisions," using energy and environmental case studies (1993-1997).

- Supervisor of graduate student research. Application areas include forest and fishery resource management, communications satellite planning, decision analysis of medical treatment.

- Guest lecturer for graduate-level courses in decision analysis and summer executive seminar programs.

- Teaching assistant to Professor Ronald A. Howard in 1966 for the first course in decision analysis taught at Stanford University.

OTHER MANAGEMENT TRAINING AND TECHNICAL EDUCATION EXPERIENCE

- Over fifty seminars in decision analysis, risk assessment, capital expenditure analysis, and related subjects for analysts and executives in the United States, Europe, and Latin America.

- Invited presentations, lectures, and testimony for a variety of professional societies, conferences, academic audiences, public utility commissions, Congressional committees, and other legislative bodies.

MANAGEMENT EXPERIENCE

- President, Decision Focus Incorporated (1979-1981, 1983-1984). Senior Vice President, other periods from 1977-1998.

- Assistant Director, Decision Analysis (1975-1977) at Stanford Research Institute.

- Supervisor or leader of over forty major DFI and SRI research projects.

ACADEMIC BACKGROUND

Ph.D., Operations Research, Stanford University (1970); decision theory, decision analysis, optimization theory and mathematical programming, probabilistic systems modeling and analysis, economics. Dissertation research involved the theoretical unification of entropy characterization and sufficient statistics characterization of families of probability distributions.

M.S., Physics (1963) and Mathematics (1966), Stanford University.

B.S., Physics, Yale University (1962).

PROFESSIONAL ASSOCIATIONS AND HONORS

- Frank P. Ramsey Medal for outstanding career achievement, awarded in 1997 by the Decision Analysis Society of the Institute for Operations Research and the Management Sciences. The citation for this award recognized contributions to public sector applications of decision analysis, particularly those involving environmental protection.

- Presidential appointee following nomination by the National Academy of Sciences, Nuclear Waste Technical Review Board, 1989 - May, 1994.

- Society for Risk Analysis (president, 1991-1992; past member of the national council, past President of Northern California chapter; member of the editorial boards of *Risk Analysis*, *Risk Abstracts*).

- The Institute for Operations Research and the Management Sciences (associate editor, *Management Science*)

- Sigma Xi, Phi Beta Kappa.
- National Science Foundation fellowships in physics (1962-4), mathematics (1965-7).

PROFESSIONAL CERTIFICATIONS

Certified in February, 1994 as a Qualified Environmental Professional (QEP) by the Institute of Professional Environmental Practice. The QEP credential is a multi-disciplinary certificate that emphasizes a multi-media perspective on environmental issues. It is given to senior environmental professionals who have technical baccalaureate and/or master's degree plus 15 years of experience, or 20 years of experience with a non-technical degree.

SELECTED PUBLICATIONS

"A Tutorial Introduction to Decision Theory," *IEEE Transactions on Systems Science and Cybernetics*, Vol. SSC-4, p. 105-115, 1968

"The Decision to Seed Hurricanes," (with R.A. Howard and J.E. Matheson), *Science*, Vol. 176, p. 1191-1202, 1972.

"The Trials and Tribulations of the Tribnian Situation: A Pilot Level Decision Analysis of Intelligence Resource Allocation," (with A.F. Grum and N.C. Williams), Research Report, Stanford Research Institute, 1972 (subsequently used as a text at the U.S Military Academy, West Point).

"New Methodology for Assessing the Probability of Contaminating Mars," (with B.R. Judd and J.P. Pezier), *Life Sciences and Space Research*, Vol. 13, p. 103-109, 1974.

"Planning Wildfire Protection for the Santa Monica Mountains," (with F. Offensend and C.N. Smart), *Fire Journal* Vol. 69, January 1975.

"A Methodology for Analyzing Emission Control Strategies," (with M.W. Merkhofer), *Computers and Operations Research*, Vol. 3, p. 185-207, 1976.

"Decision Analysis of Program Choices in Magnetic Fusion Energy Development," (with D.N. Stengel), *Management Science* Vol 28, p. 276-288, 1982.

"Quantitative Analysis as a Basis for Decisions Under TSCA," *TSCA's Impact on Society and Chemical Industry*, Washington D.C.: American Chemical Society 1983.

Risk Assessment in the Federal Government: Managing the Process, (with committee), Washington, D.C.: National Academy Press, 1983.

Disposal of Chemical Munitions and Agents, (with committee), Washington, D.C.: National Academy Press, 1984.

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Risk Assessment and Acid Rain Policy: A Decision Framework that Includes Uncertainty," (with W.E. Balson), *ACID RAIN: Economic Assessment*, New York: Plenum Press, 1985.

Review of EPA's Risk Assessment Research Program, letter report to the EPA Administrator on behalf of the EPA Science Advisory Board, April 22, 1985.

"Risk Assessment: What It Is: How It Works," (with Terry Yosie), *EPA Journal*, Vol. 13, No. 9, November 1987.

"Analysis of Uncertainty and Reaching Broad Conclusions," *Journal of the American College of Toxicology*, Vol. 7, 1988.

Improving Risk Communication, (with committee), Washington, D.C.: National Academy Press, 1989.

Testimony, Hearing before the Subcommittee on Nuclear Regulation, Committee on Environment and Public Works, U.S. Senate: "Phosphate Slag Risk," pp. 61-63, 129-133, August 21, 1990

"Decision Analysis in Environmental Risk Management: Applications to Acid Deposition and Air Toxics," *New Risks*, New York: Plenum Press, 1990.

"Risk Analysis: Where Have We Been? Where Are We Going?" *Risk Analysis* Vol. 10, No. 2, 1990.

"Do We Know Enough to Take a Risk-Based Approach?" *EPA Journal* Vol. 17, No. 2, 1991.

"Risk Assessment for Ingested Inorganic Arsenic: A Review and Status Report," *Environmental Geochemistry and Health* Vol. 14, 1992.

"Conclusion: Challenges for the Future," (summary of a conference on the health effects of gasoline) *Environmental Health Perspectives Supplements* Vol. 101 (Suppl.6), p. 209-212, 1993.

Science and Judgment in Risk Assessment, (with committee), Washington, D.C.: National Academy Press, 1994.

"The Value of Research on Health Effects of Ingested Inorganic Arsenic," (with F. Selker and T. Guardino), *Arsenic Exposure and Health*, W.R. Chappell et. al., eds., Northwood: Science and Technology Letters, 1994.

Testimony, Hearing before the Subcommittee on Oversight and Investigations, Committee on Commerce, U.S. House of Representatives: "Clean Air Act Amendments: Title lll - Hazardous Air Pollutants," pp. 85-91, June 29, 1995

"Use of Expert Judgment on Cancer Dose-Response: Probabilistic Assessment and Plans for Application to Dieldrin," *Low-Dose Extrapolation of Cancer Risks: Issues and Perspectives*, Stephen Olin et. al., eds, Washington, D.C.: International Life Sciences Institute Press, pp. 275-287, 1995.

"Limitations, Definitions, Principles, and Methods of Risk Analysis," Risk Assessment for Veterinary Biologicals, special issue, *Office International des Epizooties, Scientific and Technical Review*, Vol. 14, pp. 913-923, 1995.

Understanding Risk: Informing Decisions in a Democratic Society, (with committee), Washington, D.C.: National Academy Press, 1996.

"Understanding and Managing Environmental Risk: An Overview for Concerned Citizens," A Talk for the Boise City Club, September 10, 1996

"Risk Perception Versus Performance Assessment Products: Improving the Balance for the Management of Nuclear Waste in the United States, " *Probabilistic Safety Assessment and Management '96*, C. Cacciabue and I. A. Papazoglou, eds, London: Springer, pp. 1777-1782, 1996

Testimony, Hearing before the Subcommittee on Workforce Protections, Committee on Education and the Workforce, U.S. House of Representatives: "Congressional Review Act on OSHA's Methylene Chloride Rule," April 16, 1997.

"Unresolved Problems of Radioactive Waste: Motivation for a New Paradigm," *Physics Today*, pp. 48-54, June 1997.

"Inorganic Arsenic: A Need and an Opportunity to Improve Risk Assessment," (with W. Chappell, B. Beck, K. Brown, R. Chaney, R. Cothern, K. Irgolic, I. Thornton, and T. Tsongas), *Environmental Health Perspectives*, **105**(10), 1061-67, 1997.

"Arsenic: past, present, and future considerations," (with H. Gibb and C. Abernathy), pp. 406-423, *Arsenic: Exposure and Health Effects*, Proceedings of the Second International Conference on Arsenic, C. O. Abernathy, R. L. Calderon, and W. R. Chappell, eds., London: Chapman-Hall, 1997.

"Risk Characterization: A Bridge to Informed Decision Making," (with Edward V. Ohanian, John A. Moore, John R. Fowle III, Gilbert S. Omenn, Steven C. Lewis, and George M. Gray), Workshop Overview, *Fundamental and Applied Toxicology* **39**, 81-88, 1997.

"Message," *Japanese Journal of Risk Analysis*, 8(2), ii, November 1997.

"Nuclear Waste Management: Shifting the Paradigm," *Reliability Engineering and System Safety*, 59, 123-128, 1998.

"Informing the People's Discretion about Environmental Risks: Can This Challenge Be Met?" Probabilistic Safety Assessment and Management, PSAM 4, Proceedings of the 4th International Conference, 13-18 September 1998, New York City, A. Mosleh and R.A. Bari, eds., New York: Springer-Verlag, 1998.

"Risk Assessment Using the Taiwan Data Base: The Need for Further Research," Debate/Commentary: Arsenic and Human Health Risk Assessment, *Human and Ecological Risk Assessment*, 4(5), 1051-1060, 1998.

William J. Bair, Ph.D.

William J Bair

[redacted]

Radiation Biologist

Retired in 1993 as Manager of Life Sciences Center; Battelle, Pacific Northwest National Laboratory, Richland, WA. Part time Senior Advisor for Health Protection Research serving as member of Institutional Review Board for human subjects research (1993-).

Education

B.A Chemistry ([redacted] Ohio Wesleyan University; Delaware, Ohio
Ph.D. Radiation Biology (1[redacted]), University of Rochester; Rochester, New York.

Summary

Dr. Bair's primary area of research is the inhalation toxicology of radionuclides and the biological effects of plutonium and other transuranic elements. His research on the deposition, retention, and translocation of inhaled substances demonstrated the relevance of particle size to pulmonary dynamics, leading to improved dosimetric models of the respiratory tract. He also led research that contibuted to an increased understanding of the biological effects of radionuclides, particularly when taken into the body through the respiratory tract. The results of his work have been effectively applied to the development of international radiation protection standards. Recognition of his early contributions included the E. O. Lawrence Award in 1970 by the U. S. Atomic Energy Commission.

He has served on various committees and task forces for the U.S. Atomic Energy Commission, the Energy Research and Development Administration, the Department of Energy, the Environmental Protection Agency, the Nuclear Regulatory Agency, the Department of Defense and organizations such as the National Academy of Sciences, the World Health Organization, the International Atomic Energy Agency, the National Council on Radiation Protection and Measurements, and the International Commission on Radiological Protection. For example, he chaired the DOE Advisory Committee on Radiological Aspects of the Northern Marshall Islands; he participated in the President's Commission on the Accident at Three Mile Island; and chaired the DOE Task Group on the Health and Environmental Consequences of the Soviet Nuclear Accident. He also served as Vice-Chairman of the National Academy of Sciences/National Research Council Committee on the Biological Effects of Internally Deposited Alpha-Emitting Radionuclides (BEIR-IV), became a member of the NCRP in 1973 and a member of Committee 2 of the ICRP in 1974. In 1993 he was appointed to the Science Advisory Board of the U.S. Environmental Protection Agency by the Administrator and serves on the Radiation Advisory Committee. In 1997 he was appointed to the National Academy of Sciences/Institute of Medicine Committee on Battlefield Radiation Exposure Criteria.

Dr. Bair was Manager of the Life Sciences Center 1986 to 1993. He managed all Pacific Northwest National Laboratory (PNNL) research in health physics, radiological physics, inhalation toxicology, cellular and molecular biology, radiation biology, chemical toxicology, epidemiology, and several other related fields. He was responsible for the Center's 400-member staff achieving their functional objectives and for the Center's meeting scientific, operational and business standards and goals. He was also responsible for major interactions with sponsors of research in the Life Sciences Center.

From 1975 to 1990 Dr. Bair managed the DOE Environment, Health and Safety Research Program at PNNL. This program included basic and applied research on radiation protection and occupational health and safety; the application of nuclear technology to medicine; and research on health and

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environmental aspects of the development of several energy resources. This multidisciplinary program comprised studies on the characterization and transport of potentially toxic substances in air, land, water and marine environments, and on potential impacts of nuclear and nonnuclear energy technologies on the environment and on animal and human health.

From 1973 to 1975, Dr. Bair managed the Life Science program at PNNL. He managed, in turn, PNNL's Biology Department (1968-1975) and the Inhalation Toxicology Section of that Department (1956-1968). From 1954 to 1956 he was a biological scientist in the same organization which, at that time, until 1965, was part of the Hanford Laboratory operated by the General Electric Company.

He was a member of Faculty, Tri-Cities University Center (operated by Oregon State University, Washington State University, and the University of Washington) lecturing in Radiation Biology from 1955 to approximately 1985.

From 1943 to 1946 he served in the U.S. Army in the European and Asiatic - Pacific Theaters, receiving the Combat Infantryman Badge and the Bronze Star Medal. He has participated in numerous community activities, serving as member of the board of director's of the local Kiwanis Club, Community Concert Association and the Central United Protestant Church.

Professional Affiliations and Appointments

- Listed in American Men and Women of Science, Men of Achievement, Who's Who in America, Who's Who in the West, Who's Who in the World
- Fellow, American Association for the Advancement of Science
- Fellow, Health Physics Society
- Life Member, Health Physics Society

  Member, Board of Directors, Columbia Chapter (1961)
  Member, Program Committee for national meeting (1962, 1966-1967, 1970-1971)
  Member, Nominating Committee (1964)
  Chairman, Program Committee, national meeting, Chicago (1970)
  Member, Board of Directors (1970-1973, 1983-1986)
  Chairman, Scientific and Societal Issues Committee (1983-1984)
  president-elect (1983-1984)
  President (1984-1985)
  Past President (1985-1986).
  Chairman, Awards Committee (1986)
  Chairman, Presidents Emeritus Committee (1991)

- Member, Board of Directors of Washington Association for Biomedical Research (1989-1993)
- Member, Radiation Research Society
- Member, Society for Occupational and Environmental Health
- Member, Society for Risk Analysis
- Member, Reticuloendothelial Society

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- Member, Sigma Xi, Tri-Cities Chapter, Vice Chairman (1973-1974)

- Member, Society for Experimental Biology and Medicine, Vice-Chairman for Northwest Section (1967-1970, 1974)

- Member, National Council on Radiation Protection and Measurements (1973-1992), Honorary Member (1992-)

  Member, Scientific Committee 34 on Maximum Permissible Concentrations for Occupational and Nonoccupational Exposure (1970-1977)
  Chairman, Ad Hoc Committee on Hot Particles (1974-1975)
  Member, Scientific Committee 1 on Basic Radiation Protection Criteria (1975-1993)
  Chairman, Ad Hoc Committee on Internal Emitter Activities (1976-1977)
  Member, Board of Directors (1976-1982)
  Member, Scientific Committee 57 on Internal Emitter Standards (1977-1993)
  Member, Annual Meeting Program Committee (1983)
  Member, Nominating Committee (1983-1987).
  Lauriston S. Taylor Lecturer (1997).

- U.S. Atomic Energy Commission (AEC)/U.S. Energy Research and Development Administration (ERDA)/U.S. Department of Energy (DOE)

  Member, several AEC ad hoc committees on radionuclide toxicology and biomedical hazard evaluation.
  Member, Nevada Applied Ecology Group Ad Hoc Pu Committee, AEC/ERDA: advised on health and environmental issues at the Nevada Test Site and Rocky Flats (1970-1977).
  Chairman, Transuranium Technical Group to advise AEC on biomedical research on transuranium elements (1972-1976).
  Chairman, Ad Hoc Committee to evaluate the health and safety aspects of ^{238}Pu in the environment adjacent to the Mound Laboratory for ERDA (1975-1976).
  Chairman, DOE Advisory Committee on Radiological Aspects of the Northern Marshall Islands (1978-1980).
  Member, U.S. Delegation to International Atomic Energy Agency (IAEA) Post-Chernobyl Accident Meeting in Vienna (8/25-29/86).
  Chairman, DOE Task Group on Health and Environmental Consequences of the Soviet Nuclear Accident (1986-1987).

- National Academy of Sciences (NAS)

  Member, Subcommittee on Inhalation Hazards of Committee on Pathologic Effects of Atomic Radiation (1957-1964).
  Member, Ad Hoc Committee on Hot Particles of the Advisory Committee on the Biological Effects of Ionizing Radiation (1974-1976).
  Vice Chairman, Committee on Biological Effects of Ionizing Radiation IV-Alpha, BEIR IV, (1984-1987).
  Member, Committee on Battlefield Radiation Exposure Criteria (1997-1999).

- International Commission on Radiological Protection

  Chairman, Task Group on the Biological Effects of Inhaled Particles (1969-1979)
  Member, Committee 2 on Secondary Limits (1974-1993)
  Chairman, Task Group on Human Respiratory Tract Model (1984-1993)

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- Environmental Protection Agency, Member Science Advisory Board, Radiation Advisory Committee (1993-)

- U.S. Participant in IAEA/World Health Organization Scientific Meeting on Diagnosis and Treatment of Radioactive Poisoning, Vienna (1962)
- U.S. Participant in IAEA Symposium on Radiological Health and Safety in Nuclear Materials Mining and Milling, Vienna (1963)

- U.S. Participant, IAEA Seminar on Radiological Safety Evaluation of Population Doses and Application of Radiological Safety Standards to Man and the Environment, Portoroz, Yugoslavia (1974)

- Chairman, International Panel to Consider the Question of Coordination of National Research on the Detection and Assessment of Uranium and Plutonium in the Whole Body and in Critical Organs, IAEA, Vienna (1968)

- Chairman, Hanford Symposium on Inhaled Radioactive Particles and Gases (1964)

- Cochairman, Hanford Symposium on Biological Implications of the Transuranium Elements (1971)

- Chairman, Hanford Symposium on Radiation Protection--A Look to the Future (1986)

- Participant, International Radiation Protection Association Meetings: Rome (1966); Brighton, invited speaker (1970); Jerusalem, 1980; Berlin, Member, Program Committee, 1984; Sydney, 1988; Montreal, 1992; Paris, 1977.

- Member, Joint Space Nuclear Systems/Biomedical and Environmental Research Working Group, AEC (1967-1973)

- U.S. Representative to United States/Canada/France Meeting on Radiological Problems of Uranium Mining, Paris (1968)

- Participant, Technical Aid Program sponsored by the Japan Atomic Energy Commission; presented series of lectures at the National Institute of Radiological Sciences in Chiba-shi, Japan, at Kyoto University, at the Japan Atomic Energy Research Institute in Tokai, and at the Japan Health Physics Society and Radiation Research Society Meeting in Tokyo (1969)

- Invited Speaker, Symposium on the Relation of Inhalation Exposure to Carcinogenesis, held in conjunction with the Conference on Inhalation Carcinogenesis, Gatlinburg, TN (1969)

- Invited Speaker, Seminar on Radiation Protection Problems Relating to Transuranium Elements, sponsored by EURATOM and the European Nuclear Energy Agency of the Organization for Economic Cooperation and Development, Karlsruhe, FRG (1970)

- Consultant, U.S. Nuclear Regulatory Commission Advisory Committee on Reactor Safeguards (1971-1987)

- Member, Associated Universities' Review Committee, Radiological and Environmental Research Division, Argonne National Laboratory (1977-1980)

- Member, Ad Hoc Committee to Assess the Radionuclide Toxicology Research Program at the Kernforschungszentrum, Karlsruhe, FRG (1979)

- Member, World Health Organization, Working Group on Health Aspects Related to Actinides and Their Decay Products, Brussels (1979)

- Cochairman and Organizer, Symposium on Toxicology of Radionuclides at the Sixth International Congress of Radiation Research, Tokyo (1979)

- Invited Participant, German Atom Forum Conference on Radioecology, Bonn (1979)
- Member, President's Commission on the Accident at Three Mile Island, Vice Chairman of Health Effects Panel (1979-1980)

- Invited Lecturer, South African Association of Physicists in Medicine and Biology, Pretoria and Pelindaba (1980)

- Invited Speaker, NCRP Annual Meeting, Washington, DC, (1981)

- Invited Lecturer, North China Institute of Radiation Protection in Taiyuan, Shan Xi, Institute of Atomic Energy and Institute of Radiation Medicine in Beijing, and the Chinese Society of Radiation Protection (1983)

- Invited Speaker, 11th Annual WATTec Energy Conference and Exhibition, Symposium on Risks to Lifestyle and Survival, sponsored by the Health Physics Society and Society for Risk Analysis (1984)

- Invited Speaker, Workshop on Lung Modeling for Inhalation of Radioactive Materials, sponsored by the National Radiological Protection Board, Oxford (1984)

- Invited Speaker, Health Physics Society Annual Meeting, Pittsburgh, 1986; Boston, 1988

- Chairman, DOE Task Group on Health and Environmental Consequences of the Soviet Nuclear Accident (1986-1987)

- Member of U.S. Delegation in meetings with USSR on the Chernobyl Accident, IAEA (1987)

- Guest, USSR Meeting on the Health Consequences of the Chernobyl Reactor Accident, Kiev, 1988

- Invited Lecturer, National Institute of Radiological Sciences in Chiba-shi, Japan and Radiation Effects Research Foundation in Hiroshima, Japan, 1989.

- Invited speaker, National Radiological Protection Board, Chilton, England: New ICRP Human Respiratory Tract Model for Radiological Protection, March, 1993.

- Invited participant in Review of IAEA Coordinated Research Program on the Radiological Impact of Hot Beta Particles from the Chernobyl Fallout: Risk Assessment, Gyuletchitsa, Bulgaria, September 6-10, 1993.

Honors and Awards

- National Research Council/AEC Fellowship in Radiological Physics, University of Rochester (1949-1950)
- AEC E. O. Lawrence Memorial Award for Research on Radiation Biology of Inhaled Radionuclides (1970)
- AEC Certificate of Appreciation for assisting in the preparation and presentation of AEC testimony on plutonium and other transuranic elements (1975)
- Distinguished Achievement Alumni Citation, Ohio Wesleyan University (1986)
- Distinguished Scientific Achievement Award, Lifetime Membership, Health Physics Society (1991)
- Lifetime Membership, Columbia Chapter, Health Physics Society (1991)
- Honorary Member, National Council on Radiation Protection and Measurements (1992-).
-
- 1997 Lauriston S. Taylor Lecturer, National Council on Radiation Protection and Measurements Annual Meeting.

Contributions to Committee Reports

NAS/NRC. 1961. *Effects of Inhaled Radioactive Particles*, Publication 848. Washington, DC.

NCRP. 1975. *Alpha-Emitting Particles in the Lung*, NCRP Report No. 46. Washington, DC.

NAS/NRC. 1976. *Health Effects of Alpha-Emitting Particles in the Respiratory Tract*, EPA 520/4-76-013. Washington, DC.

ICRP. 1979 (Part 1 and Supplement to Part 1), 1980 (Part 2), 1981 (Supplement to Part 2, and Part 3), 1982 (Supplements A and B to Part 3). *Limits for Intakes of Radionuclides by Workers*, ICRP Publication 30. Pergamon Press, Oxford.

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CURRICULUM VITA OF

ARJUN MAKHIJANI

Education:

Ph.D. (Engineering - dissertation area: controlled nuclear fusion), University of California, Berkeley, 1972.

M.S. (Electrical Engineering - thesis area: ionospheric wave propagation), Washington State University, Pullman, Washington, 1967.

Bachelor of Engineering (Electrical), University of Bombay, Bombay, India, 1965.

Current Employment:

President, Institute for Energy and Environmental Research, Takoma Park, Maryland.

Professional Societies:

American Association for the Advancement of Science
Institute of Electrical and Electronics Engineers
American Geophysical Union
American Institute of Physics

Awards:

The John Bartlow Martin Award for Public Interest Magazine Journalism of the Medill School of Journalism, Northwestern University, 1989, with Robert Alvarez.

Consulting Experience, 1975-1987:

Consultant on a wide variety of issues relating to technical and economic analyses of alternative energy sources; electric utility rates and investment planning; energy conservation; analysis of energy use in agriculture; energy policy for the U.S.; energy policy for the Third World; evaluations of portions of the nuclear fuel cycle.

Partial list of institutions to which I was a consultant in the 1975 -1987 period:

Lawrence Berkeley Laboratory
Tennessee Valley Authority
Ford Foundation
United Nations University
Federation of Rocky Mountain States
Food and Agriculture Organization of the United Nations
International Labour Office of the United Nations
United Nations Environment Programme
Environmental Policy Institute
Economic and Social Commission for Asia and the Pacific
United Nations Development Programme
National Association of Atomic Veterans

Other Employment:

1984-88: Associate Professor, Capitol College, Laurel, Maryland (part-time in 1988).

1983-84: Assistant Professor, Capitol College, Laurel, Maryland.

1977-79: Visiting Professor, National Institute of Bank Management, Bombay, India. Principal responsibility was the evaluation of the Institute's extensive pilot rural development programme.

1972-74: Project Specialist, Ford Foundation Energy Policy Project. Responsibilities included research and writing on the technical and economic aspects of energy conservation and supply in the U.S.; analysis of Third World rural energy problems; preparation of requests for proposals; evaluation of proposals; and the management of grants made by the Project to other institutions.

1969-70: Assistant Electrical Engineer, Kaiser Engineers, Oakland California. Responsibilities included the design and checking of the electrical aspects of mineral industries such as cement plants, and plants for processing mineral ores such as lead and uranium ores. Pioneered the use of the desk top computer at Kaiser Engineers for the use of electrical design calculations.

Languages:

English, French, Hindi, Sindhi, Marathi

Professional Reports and Publications:

Hower, G.L. and A. Makhijani, "Further Comparison of Spread-F and Backscatter Sounder Measurements," *Journal of Geophysical Research*, 74, 3723, 1969.

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Makhijani, A. and Hisham Zerriffi, *Dangerous Thermonuclear Quest: The Potential of Explosive Fusion Research for the Development of Pure Fusion Weapons*, Institute for Energy and Environmental Research, July 1998.

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EDUCATION

[redacted] University of Marburg: Biology and Geography

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[redacted] German equivalent of Master's Degree in Biology with a thesis on plant nutrition (University of Heidelberg)

[redacted] German equivalent of Master's Degree in Geography with a specialty in soil science (University of Heidelberg)

EMPLOYMENT HISTORY

1978-1979 radioecological research on the environmental effects of the proposed reprocessing plant at Gorleben for the Department of Social Affairs (air and waster pathway), State of Lower Saxony, Federal Republic of Germany

1979-1981 member of the senior research staff of IFEU-Institut für Energie- und Umweltforschung Heidelberg *(Institute for Energy and Environmental Research):* participation in various projects on radioeceology and nuclear accident consequences and related topics (see publication list)

1981-1983 project director at the Institute for the "Risk Oriented Study of the Fast Breeder Reactor SNR-300 at Kalkar - Environmental Impacts of Accidents", for the Department of Research and Technology, Bonn, Federal Republic of Germany

1984-today Executive Director of the U.S. office of the Institute for Energy and Environmental Research (IEER)

1991-today	Director of Environmental Programs at IFEU-Institut für Energie- und Umweltfoschung Heidelberg, member of the board of directors
1992-today	Member of the Scientific Management Team of the Rongelap Resettlement Project
1995-today	President of IFEU-Institut für Energie- und Umweltforschung Heidelberg

PROFESSIONAL MEMBERSHIPS

Health Physics Society, U.S.A.
Federation of Radiation Protection, Federal Republic of Germany

PERSONAL INFORMATION

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PUBLICATIONS

1. Bruland, W.; Erhard, T.; Franke, B.; Grupp, H.; v.d. Lieth, C.W.; Matthis, P.; Moroni, W.; Ratka, R.; v.d. Sand, H.; Sonnhof, U.; Steinhilber-Schwab, B.; Teufel, D.; Ulfert, G.; Weber, T.; "Radioökologisches Gutachten zum Kernkraftwerk Wyhl", Tutorium Umweltschutz an der Universität Heidelberg, Mai 1978, 2. Aufl. Juli 1978
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4. Franke, B.; Höpfner, U.; "Zur Abschätzung des Transfers von Radionukliden aus dem Futter in tierische Nahrungsmittel (Fleisch)", Modellstudie Radioökologie Biblis Bd. 9; im Auftrag des Hessischen Ministers für Wirtschaft und Technik durch das IFEU-Institut für Energie- und Umweltforschung Heidelberg e.V.; *(Transfer of Radionuclides from Fodder into Animal Food Products (Meat); Model Study Radioecology Biblis for the Hessian Minister of Research and Technology)*, Wiesbaden, 1980
5. Teufel, D; Steinhilber-Schwab, B.; Höpfner, U.; Ratka, R.; v.d. Sand, H.; Franke, B.; "Transfer von Radionukliden von Boden in Pflanzen, Zwischenbericht: Zum Einfluß verschiedener Parameter auf den Transfer von Cäsium und Strontium vom Boden in Blattgemüse, Kartoffeln und Klee", Untersuchungen zu dem Gutachten "Regionalwirtschaftliche und ökologische Auswirkungen des geplanten nuklearen Entsorgungszentrums bei Gorleben NEZ" im Auftrag des Niedersächsischen Ministers für Soziales; *(Transfer of Radionuclides from Soil to Plants: Influence of various Parameters on the Transfer of Cesium and Strontium into Leafy Vegetables, Potatoes, and Clover; for the Lower Saxony Minister of Social Affairs)*, Heidelberg, März 1979
6. Franke, B.; Höpfner, U.; Ratka, R.; Steinhilber-Schwab, B.; v.d. Sand, H.; Teufel, D.; "Zur Verwendung von Fallout-Messungen für radioökologische Berechnungen"; Untersuchungen zu dem Gutachten "Regionalwirtschaftliche und ökologische Auswirkungen des geplanten Nuklearen Entsorgungszentrums bei Gorleben NEZ" im Auftrag des Niedersächsischen Ministers für Soziales; *(Use of Fallout Data for Radioecological Calculations for the Lower Saxony Minister of Social Affairs)*, Heidelberg, März 1979
7. Bruland, W.; Franke, B.; Teufel, D.; "Transfer of organically bound radionuclides through food chains to man: model-example with radiocobalt and vitamin B_{12}"; International Symposium on Biological Implications of Radionuclides Released from the Nuclear Industries, IAEA-SM-237/17, Wien, 26.-30.03.1979
8. Franke, B.; Krüger, E.; Steinhilber-Schwab, B.; Teufel, D.; "Strahlenbelastung der Bevölkerung durch radioaktive Emissionen aus kerntechnischen Anlagen"; *(Radiation Exposure of the Population due to Radioactive Emissions from Nuclear Facilities)*, Symposium "Probleme der Energieversorgung", Ruhr-Universität Bochum, 26.-28.1979

9. Gubernator, K.; Moroni, W.; Munder, S.; Franke, B.; Ruske, B.; Teufel, D.; "Zur Problematik der Thalliumverseuchung in der Umgebung von Zementwerken"; *(The Problem of Thallium Contamination in the Vicinity of Cement Plants)*, Tutorium Umweltschutz Heidelberg und IFEU-Institut für Energie- und Umweltforschung Heidelberg e.V.; Heidelberg, Oktober 1979 (2. Aufl.)
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11. Franke, B.; Steinhilber-Schwab, B.; Teufel, D.; "Wie hoch ist die Strahlenbelastung durch die Atomenergienutzung?"; *(How High is the Radiation Exposure due to the Use of Nuclear Energy?)*, Demokratisches Gesundheitswesen Nr. 3, 1980, 21-23
12. Bussian, B.M.; Franke, B.; Hoffmann, M.; v.d. Lieth, C.W.; Matthis, P.; Pohlner, W.; "Studie über die Auswirkungen mittlerer und schwerer Unfälle im AKW Grohnde für die Bevölkerung und das Gebiet der Stadt Hameln"; Auftrag der Stadt Hameln an das IFEU-Institut für Energie- und Umweltforschung Heidelberg e.V.; *(Study on the Effects of Medium and Large Scale Accidents in the Grohnde Nuclear Power Plant for the Population and the City of Hameln; for the City of Hameln)*, Heidelberg, Januar 1980
13. Franke, B.; "Strahlenbelastung durch Normalbetrieb und mittlere Unfälle im AKW Grohnde - Berechnungen für das Grundstück Lohmann"; IFEU-Institut für Energie- und Umweltforschung Heidelberg e.V.; *(Radiation Exposure due to Routine Operation and Medium Scale Accidents in the Grohnde Nuclear Power Plant - Calculations for the Lohmann House)*, Heidelberg, Januar 1980 (Ergänzung Febr. 1980)
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15. Teufel, D.; Franke, B.; Steinhilber-Schwab, B.; "Beantwortung des Fragenkatalogs zum Themenkreis Radioökologie der Enquete-Kommission 'Zukünftige Kernenergie-Politik' des Deutschen Bundestages", Heidelberg, März 1980; *(Answers to Questionnaire Radioecology for the Enquete Commission on Future Nuclear Energy Policy of the German Federal Parliament)*, in: Materialband 1 zum Bericht der Kommission (Drucksache 8/ 4341) sowie als IFEU-Bericht Nr. 9, Heidelberg, Oktober 1980
16. Franke, B.; Teufel, D.; "Radiation Exposure due to Venting TMI-2 Reactor Building Atmosphere"; A study prepared by the Institute for Energy and Environmental Research, Heidelberg, for the Three Mile Island Legal Fund, Washington, D.C.; Heidelberg, June 12, 1980
17. Franke, B.; "Effecten van straling in het milieu"; *(Radiation Effects to the Environment)*, in: Risiko's van lage stralingsdoses - versalg van een internationale hearing, gehouden op 31 oktober 1979 te Vlissingen; IMGO regionale ontwikkeling, Middelburg, NL, 1980
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POSITIONS:

USAEC Special Fellowship in Radiological Physics, University of California, Berkeley, California, 1959–1961

National Science Foundation Graduate Fellow, University of California, Berkeley, California, 1961–1963

Biophysicist, Biomedical and Environmental Research Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1963–1974

Biophysicist and Group Leader for Applied Environmental Sciences, Biomedical and Environmental Research Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1974–1975

Biophysicist and Section Leader for Analysis and Assessment, Environmental Sciences Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1976–1982

Biophysicist and Division Leader, Environmental Sciences Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1982–1992

Biophysicist and Director, Risk Sciences Center, Health and Ecological Assessment Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1993–1995

Biophysicist and Director, Dose Reconstruction Program, Atmospheric and Ecological Sciences Program, Health and Ecological Assessment Division, Lawrence Livermore National Laboratory, University of California, Livermore, California, 1995–1996

Research Professor of Pharmacology and Toxicology, Division of Radiobiology, School of Medicine, University of Utah, Salt Lake City, Utah, 1997–Present

CONCURRENT POSITIONS:

Teacher, University Extension, University of California, Berkeley, California, 1966–1969

Lecturer, Department of Chemistry, San Jose State University, San Jose, California, 1975

Faculty Affiliate, Colorado State University, Fort Collins, Colorado, 1979–1983

Scientific Director, NTS Off-Site Radiation Exposure Review Project, 1979–1996

Scientific Director, Nevada Applied Ecology Group, 1983–1986

Scientific Director, Basic Environmental Compliance and Monitoring Program, Nevada Test Site, 1986–1992

Guest Lecturer, University of California, Los Angeles, California, 1992–Present

Guest Lecturer, Stanford University, Stanford, California 1992

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Co-Director, Risk Sciences Program, Lawrence Livermore National Laboratory, Livermore, California, and University of California, Davis, California, 1992–1995

Visiting Lecturer and Associate in the Experiment Station, University of California, Davis, California, 1992–1995

Guest Lecturer, University of California, Berkeley, 1995–1997

RESEARCH:

Trace Elements in Human Metabolism
Aeolian Resuspension of Transuranic Radionuclides
Public Health Implications of the Use of Nuclear Energy
Environmental Effects of Utilizing Geothermal Energy
Reconstruction of Radiation Doses from Early Fallout of Nuclear Weapons Tests
Calculation of Radiation Doses from Nuclear Reactor Accidents

PROFESSIONAL SOCIETIES:

American Association for the Advancement of Science
Health Physics Society
- President, Environmental Radiation Section, 1984–85
- President-Elect, Northern California Chapter, 1985–86
- President, Northern California Chapter, 1986–87
- Member, Research Needs Committee, 1994–1997
- Member, International Relations Committee, 1997–Present

International Union of Radioecology
Radiation Research Society
Society for Risk Analysis

PROFESSIONAL ACTIVITIES:

Consultant, Subcommittee to Develop a Federal Strategy for Research Into the Biological Effects of Ionizing Radiation; Interagency Radiation Research Committee, 1979
Member, Fallout Study Advisory Committee, University of Utah, 1983–1986
Consultant, Subcommittee on Risk Assessment for Radionuclides, Science Advisory Board, Environmental Protection Agency, 1984
Member, *Ad Hoc* Working Group to Review a Veterans Administration Health Assessment Project, Interagency Radiation Research Committee, 1984
Member, Task Group 7 (Contaminated Soil), Scientific Committee 64 (Radionuclides in the Environment), National Council on Radiation Protection and Measurements, 1985–1990
Member, Review Panel on Total Human Exposure, Subcommittee on Strategies and Long-Term Research Planning, Science Advisory Board, Environmental Protection Agency, 1985

Member, DOE/OHER Interlaboratory Task Group on Health

and Environmental Aspects of the Soviet Nuclear Accident and Member, Committee on the Assessment on Health Consequences in Exposed Populations, 1986–1987

Member, Task Group on Exposure of American People to Iodine-131 from NTS Fallout, National Cancer Institute Thyroid/Iodine-131 Assessment Committee, 1986–1993

Member, United States Delegation, United Nations Scientific Committee on the Effects of Atomic Radiation, 1987–Present

Member, Biomedical and Environmental Effects Subpanel, Interagency Nuclear Safety Review Panel, Office of Science and Technology Policy, 1988–Present

Member, Executive Steering Committee, University of California Systemwide Toxic Substances Research and Teaching Program, 1989–1993

Member, National Laboratory Directors' Environmental and Public/Occupational Health Standards Steering Group, 1989–1996

Consultant, International Atomic Energy Agency, 1989–1992, 1996

Member, National Council on Radiation Protection and Measurements, 1989–Present
- Member, Program Committee, 1989–1990
- Chairman, Scientific Committee 84 on Radionuclide Contamination, 1990–1995
- Member, Program Committee, 1994–1995
- Vice Chairman, Scientific Committee 64 on Radionuclides in the Environment, 1995–Present

US Leader, Working Group on Environmental Transport, US-USSR Joint Coordinating Committee for Civilian Nuclear Reactor Safety, 1989–1995

Member, International Committee to Assess the Radiological Consequences in the USSR for the Chernobyl Accident, International Atomic Energy Agency, 1990–1991

Co-Leader, Task on Corroboration of Dose Assessment, International Committee to Assess the Radiological Consequences in the USSR from the Chernobyl Accident, International Atomic Energy Agency, 1990–1991

Member, California Radiation Emergency Screening Team, Department of Health Services, State of California, 1990–1996

Member, Environmental Management Advisory Board, Department of Energy, 1992–Present

Member, National Cancer Institute, Committee on Fallout Radiation Effects on Thyroid (FRETTERS), 1995–1996

Member, National Academy of Sciences/National Research Council, Committee on an Assessment of CDC Radiation Studies, 1997–Present

Consultant, National Academy of Sciences/Institute of Medicine/National Research Council, Committee on Exposure of American People to I-131 from Nevada Atomic Tests: Implications for Public Health, 1998–Present

HONORS:

Sigma Xi
Fellow, Health Physics Society, 1989
Elected Member, National Council on Radiation Protection and Measurements (NCRP), 1989–1995, 1995–2001

BIBLIOGRAPHY

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PUBLICATIONS

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Allan C. B. Richardson

ALLAN C.B. RICHARDSON

Mr. Richardson joined the Environmental Protection Agency (EPA) when it was formed in 1970. He has led or played a key role in the development of most of the Agency's standards for radiation since then, including the current national environmental standards for nuclear power reactors and fuel cycle facilities, Federal radiation protection guidance for medical use of diagnostic x rays, guidance on radon exposure in homes, standards for cleanup and disposal of uranium mill tailings, guidance to Federal agencies and the States on protective action levels for nuclear emergencies, Federal guidance for occupational exposure, and the proposed new Federal guidance for exposure of the general public. His contributions to radiation protection include the development and first use of the concept of collective dose and of radiation risk assessments in regulatory analyses; and harmonization of federal risk assessment through initiating and guiding to completion Federal Guidance Reports 11 and 12, which provide standard tables of doses for internal and external exposure to radiation, and Report 13, which does the same for cancer risk from internal and external exposure. His most recent position, prior to retiring after forty-one years of government service, in April 1998, was Associate Director for Radiation Policy in EPA's Office of Radiation and Indoor Air.

He is a past member of Committee 4 of the International Commission on Radiological Protection, and has served as a consultant to the International Atomic Energy Agency, the European Economic Community, and the Nuclear Energy Agency of the OECD on basic principles for radiation protection, environmental standards, control of global pollutants, emergency response to nuclear accidents, cleanup of contaminated sites, disposal of uranium mill tailings, and general principles for exemption of radioactive materials. He recently served as senior advisor to the Advisory Committee on External Regulation of Department of Energy Nuclear Safety, whose recommendation to the Secretary of Energy that all of its nuclear facilities be externally regulated is now in the process of being implemented.

Mr. Richardson holds a B.S. in Chemistry and an M.S. in Molecular Physics, and spent the first twelve years of his professional career as a nuclear physicist at the National Bureau of Standards (NBS). Significant outputs at the NBS included the first experimental determination that some nuclei are permanently distorted (in the ground state), through an extremely precise measurement of the scattering of 14 Mev neutrons by holmium nuclei aligned through the interaction of a single crystal with a superconducting magnetic field at 0.3 degrees above absolute zero; and an experimental determination of the age of fast neutrons, which removed a longstanding discrepancy with theory dating from Enrico Fermi's early work on neutron diffusion.

He has been awarded the EPA Bronze Medal three times and the EPA Distinguished Career Award, and is the author of many publications in professional journals and technical reports. [redacted]

June, 1998

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Curriculum Vitae

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Present position: Private consultant on radiation protection matters.

1995-1998: Associate Director for Radiation Policy, Radiation Protection Division, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency (EPA). *Initiated and co-authored U.S. Federal Guidance Report 13: "Health Risks from Low-Level Environmental Exposure to Radiomuclides." Served as EPA's advisor to the Secretary of Energy's Advisory Committee on External Regulation of Department of Energy (DOE) Nuclear Safety, and as a principle author of their final report. U.S. member of Committee 4 of the International Commission on Radiological Protection .*

1992-1995: Deputy Director for Federal Guidance, Criteria and Standards Division, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency. *Developed proposed Federal guidance on radiation exposure of the public. EPA lead on harmonization of radiation protection policy between EPA and the Nuclear Regulatory Commission. Published Federal Guidance Report 12: "External Exposure to Radionuclides in Air, Water and Soil." U.S. member of Committee 4 of the International Commission on Radiological Protection.*

1970-1992: Chief, Guides and Criteria Branch, General Radiation Standards Branch, and Federal Guidance Branch, of the Criteria and Standards Division, Office of Radiation Programs, U. S. Environmental Protection Agency. *Developed U.S. environmental radiation standards for nuclear power reactors and fuel cycle facilities, U.S. standards for cleanup and disposal of uranium mill tailings, and Presidential radiation protection guidance for occupational exposure. Co-developed guidance on the use of diagnostic x rays in medicine; U.S. and international guidance on intervention levels for emergency response to nuclear accidents, and early guidance on radon exposure in houses. Initiated the Federal Guidance Reports on exposure, dose and risk; co-authored Report 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion and Ingestion" and a comprehensive study of the exposure of U.S. workers to radiation. Head, EPA emergency response team for the Galileo space launch.*

1969-70: Executive Secretary, Radiological Health Study Section and Radiological Health Sciences Training Committee, Environmental Control Administration, U.S. Department of Health, Education, and Welfare. *Managed the review of all research and training grants in radiological health administered by the Department.*

1959-69: Physicist in charge of the positive ion Van de Graaff accelerator facility, Center for Radiation Research, U.S. National Bureau of Standards.
From 1962-69, Project Leader for neutron cross sections. A principal output: the experimental demonstration that some nuclei are permanently distorted, through an

extremely precise measurement of the scattering of 14 Mev neutrons by aligned holmium nuclei at 0.3 °C above absolute zero.

1957-59: Staff member, Atomic and Radiation Physics Division, U.S. National Bureau of Standards. *Co-investigator in the first definative experimental determination of the age of 14 Mev neutrons, which resolved a discrepancy with theory dating from Fermi's early work on neutron diffusion.*

1957: Master of Science (Molecular Physics), University of Maryland. *Thesis: The Equation of State for Methane at Pressures to 80 Atmospheres.*

1954: Bachelor of Science (Chemistry), College of William and Mary.

Member (1993-7), Committee 4, International Commission on Radiological Protection (task group on protection criteria for chronic exposure of the public, working parties on radiation protection of the environment and on the implications of genetic predisposition to cancer for radiation protection); Consultant to the U.S. Dept. of State (use of nuclear materials in outer space), Federal Aviation Administration (occupational exposure of air crews), Dept. of Interior (cleanup of Enewetak, Marshall Islands), Federal Emergency Management Agency (nuclear accidents), International Atomic Energy Agency (emergency response levels, basic standards for radiation, policy for control of transboundary exposure, standards for environmental releases, principles for exemption of radiation sources, upper bounds for global and regional sources), the Nuclear Energy Agency of the OECD (control of long-lived radionuclides), and State governments (radon, cleanup, and emergency response).

Recipient of the EPA Distinguished Career Award, three EPA Bronze medals, and a Special Act Award from the Department of Energy; a present or past member of the American Physical Society, the American Chemical Society, the Health Physics Society, the American Nuclear Society, and the honorary society, Sigma Xi.

Married to Sarah Fisher; three children: David, Andrew, and Michael; and two stepchildren: Jerome and Eden. Active or formerly active in local civic organizations, as a music director of amateur theatricals, as an amateur performer of chamber music, and as a member of several orchestras and choruses.

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Professor Whicker has over 30 years of experience in the area of radioecology. His primary duties are departmental administration, teaching graduate-level courses in radioecology and environmental contaminant modeling, supervising graduate student research, and conducting research at various facilities within the U.S. Department of Energy's nuclear complex. His research has involved radionuclide transport in aquatic and terrestrial ecosystems, radiation effects on natural plant communities and animal populations, and development of dynamic computer simulation models to assess transport, dose, and risk of radionuclides to human and non-human receptors. In recognition of his research and teaching, he received in 1990 the prestigious E.O. Lawrence Award from the U.S. Department of Energy.

Dr. Whicker serves on many national committees and advisory panels within the USA. He is a member of the National Council on Radiation Protection and Measurements and, in addition, chairs Scientific Committee 64-23 on Cesium in the Environment, and is a member of the Board of Directors of that organization. He has advised several national laboratory divisions, the Environmental Protection Agency, the Centers for Disease Control and Prevention, the National Academy of Sciences and others. He established the Par Pond Radioecology Laboratory for the Savannah River Ecology Laboratory at the Savannah River Site in South Carolina, where he maintains active research projects.

Dr. Whicker has been involved with several projects of the International Atomic Energy Agency, including the issue of radiation protection criteria for plants and animals, and training courses for students and professionals in the Ukraine. He was involved with the first international BIOMOVS project to test foodchain transport models. He is currently assisting the International Commission on Radiation Units and Measurements in developing guidelines for field sampling in radioecology. He is a Fellow member of the International Union of Radioecologists. He is Associate Editor for the Americas for the Journal of Environmental Radioactivity.

BIOGRAPHICAL SKETCH

Name	Position Title
F. Ward Whicker	Professor

Education (Institution & Location)	Degree	Year Conferred	Field of Study
Colo. State Univ., Ft. Collins, CO	B.S.	1962	Chemistry & Biology
Colo. State Univ., Ft. Collins, CO	Ph.D.	1965	Radiation Biology

Research and Professional Experience

1965-Present	Professor and Interim Head, Department of Radiological Health Sciences, Colorado State University.
1986-1988	Radiation Advisory Committee and Committee on Risk Assessment for Radionuclides, Science Advisory Board, U.S. Environmental Protection Agency.
1986-1989	Committee to Provide Interim Oversight of the DOE Nuclear Weapons Complex. National Research Council.
1988-Present	International Atomic Energy Agency, Vienna, special consultant on radiation protection standards for the natural environment.
1990	Review Panel on Health Effects of the DOE Nuclear Weapons Complex. U.S. Congressional Office of Technology Assessment.
1990	Recipient, E. O. Lawrence Award, U.S. Department of Energy.
1992-Present	Member of the Council. National Council on Radiation Protection and Measurements.
1993-1996	Eminent Scholar in Radioecology, Education, Research and Development Association of Georgia Universities/Westinghouse Savannah River Company.
1994	Award for Significant Scientific Contributions, Environmental Radiation Section of the Health Physics Society.
1994-Present	Board of Directors, National Council on Radiation Protection and Measurements.
1995-Present	Chairman, Scientific Committee on Radiological Units and Sampling. International Commission on Radiation Units and Measurements.
1995-Present	Board of Editors, Science of the Total Environment, Elsevier Science Publishers, Amsterdam.
1996-Present	Advisory Committee for Energy-Related Epidemiological Research. Centers for Disease Control and Prevention. Radiation and Cancer..
1996-Present	Associate Editor for the Americas. Journal of Environmental Radioactivity.

Recent Publications Relevant to PRSE (Selected from over 125 papers)

Kirchner, T.B. and F.W. Whicker. 1984. Validation of PATHWAY: A simulation model of the transport of radionuclides through agroecosystems. Ecol. Modelling 22:21-44.

Whicker, F.W. and T.B. Kirchner. 1987. PATHWAY: A dynamic foodchain model to predict radionuclide ingestion after fallout deposition. Health Physics 52(6):717-737.

Breshears, D.D., T.B. Kirchner, M.D. Otis and F.W. Whicker. 1989. Uncertainty in predictions of fallout radionuclides in foods and of subsequent ingestion. Health Physics 57(6):943-953.

Whicker, F.W., T.B. Kirchner, D.D. Breshears and M.D. Otis. 1990. Estimation of radionuclide ingestion: The PATHWAY foodchain model. Health Physics 59(5):645-657.

Breshears, D.D., T.B. Kirchner and F.W. Whicker. 1992. Contaminant transport through agroecosystems: Assessing relative importance of environmental, physiological and management factors. Ecological Applications 2:285-297.

Whicker, F.W., T.B. Kirchner, L.R. Anspaugh, and Y.C. Ng. 1996. Ingestion of Nevada Test Site Fallout: Internal Dose Estimates . Health Physics, 71(4):477-486.

Whicker, F.W. 1996. Environmental pathway analysis in dose reconstruction. pp. 93-105 In: Proceedings of the 31st Annual Meeting of the NCRP. Proc. No. 17. Environmental dose reconstruction and risk implications. National Council on Radiation Protection and Measurements. Bethesda, MD.

Webb, S.B., S.A. Ibrahim, and F.W. Whicker. 1997. A three-dimensional spatial model of plutonium in soil near Rocky Flats, Colorado. Health Physics 73(2):340-349.

Stephens, J.A., F.W. Whicker, and S.A. Ibrahim. 1998. Sorption of Cs and Sr to profundal sediments in a Savannah River Site reservoir. J. Environmental Radioactivity 38(3):293-315.

F. Owen Hoffman, Ph.D.

SENES Oak Ridge Inc.
Center for Risk Analysis
F. Owen Hoffman, President

Specialists in Energy, Nuclear and Environmental Sciences.
Custom Applications in Human Health and Ecological Assessment.

December 2, 1998

Ms. Carla Sanda
Advanced Integrated Management Services, Inc.
5460 Ward Road, Suite 370
Arvada, Colorado 80002

Dear Ms. Sanda:

I would like to thank you for considering *SENES* Oak Ridge, Inc., to conduct a peer review of the independent scientific review of the Rocky Flats radionuclide soil action levels currently being performed by Risk Assessment Corporation (RAC).

Our past experience with the amount of resources required to review draft technical reports has shown that much more is required than the $2,000 honorarium that you are presently offering. I am bringing this to your attention as I am certain that it is in the best interest of your organization to obtain a peer review that is scientifically credible and defensible.

RAC's work entails a 12-month effort with a number of draft task reports and a final draft report to be peer-reviewed. Therefore, we believe that a honorarium of at least $16,000, plus incidental expenses, would be more consistent with the level of effort required for the preparation of detailed peer-reviewed reports. This amount is estimated at a minimum of $2,500 per review for the five draft task reports and a minimum of $3,500 for the review of the final draft report that will be completed during the 12-month period. Billing would occur upon completion of the review of each document.

If, by any chance, our estimate of costs cannot be accepted by your organization, I am most willing to suggest others who may be willing to undertake the assignment. I cannot guarantee, however, that they would be willing to conduct the peer review for $2,000, considering that RAC's work involves the production of multiple draft documents.

Please feel free to contact me if you have any questions or comments. I look forward to hearing from you.

Sincerely,

F. Owen Hoffman, Ph.D.
President and Director

102 Donner Drive • Oak Ridge, Tennessee 37830 • Tel: (423) 483-6111 • Fax: (423) 481-0060 • E-Mail: 73304.3262@compuserve.com

F. OWEN HOFFMAN, Ph.D.
SENES Oak Ridge, Inc.
Center for Risk Analysis

Education

Ph.D. 1981 Ecology, University of Tennessee
M.S. 1969 Fisheries Limnology, Oregon State University
B.A. 1967 Biological Conservation, San Jose State College

Capabilities

Risk Analysis
Environmental Health Physics
Dose Reconstruction of Radionuclides and Chemicals
Radioecology/ Terrestrial/Aquatic Risk Estimation/Assessment
Statistics/Quantitative Uncertainty Analysis

Experience Summary

Dr. Hoffman has more than of 25 years of experience on the evaluation of risk to humans from the release and transport of chemicals and radionuclides in terrestrial and aquatic systems. He has led several international projects to assess the uncertainty in mathematical models used for exposure assessment and to compare model predictions against independent data sets. He has served as an advisor to dose reconstruction projects managed by the States of Tennessee and Colorado, the National Cancer Institute, and the Centers for Disease Control and Prevention. In addition he has served the community of Livermore, California (via a technical assistance grant (TAG) from EPA to Tri-Valley Care) as an independent consultant on the sampling of plutonium in Big Trees Park. He is currently a corresponding member of the International Commission on Radiological Protection and a member of the Radiation Advisory Committee of EPA's Science Advisory Board.

Experience

1992-present President and Director; *SENES* Oak Ridge, Inc., Center for Risk Analysis

- Chairman of a technical review panel for the evaluation of the uncertainty analysis methodology performed for the Hanford Environmental Dose Reconstruction Project.
- Key investigator for Oak Ridge Health Studies Dose Reconstruction Project: Task Manager for evaluating ^{131}I releases; key roles in evaluation of contaminant releases to the Clinch River, and screening for prioritization of contaminants.
- Development of an updated introductory guide for the incorporation of quantitative uncertainty analyses in human health and environmental risk assessment.
- Technical reviewer for several documents pertaining to the atmospheric and Columbia River pathway analyses for the Hanford Environmental Dose Reconstruction Project.
- International model validation projects using data sets compiled following the Chernobyl accident in 1986 for testing food chain and exposure assessment models.
- Uncertainty analysis for human health toxicity studies for contamination in the Clinch/Tennessee River System.

Experience: *SENES* Oak Ridge, Inc. (continued)

- Member of the State of Colorado's and the State of Tennessee's Health Advisory Panels and of the Centers for Disease Control and Prevention's Energy-Related Epidemiological Research Committee.
- Assessment of health risks resulting from concentrations of three contaminants in East Tennessee water systems where the contamination did not result from Department of Energy operations in Oak Ridge.
- Technical review of several documents pertaining to environmental and human health risk assessment, quantitative uncertainty analysis, dose assessments (radiological and chemical), and various computer codes.

1976-1992 Research Scientist, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

1983-1992 Environmental Sciences Division
1978-1983 Health and Safety Research Division
1976-1978 Environmental Sciences Division

- Development and evaluation of methodologies used to screen and assess the health and environmental risk of inorganic, organic and radionuclide releases from industrial facilities.
- Validation of environmental transfer model predictions using experimental field data
- Application of formal procedures for quantitative uncertainty analysis in risk assessment.
- Experimental determination of the transfer of contaminants in the atmosphere and hydrosphere to terrestrial and aquatic food chains.
- Application of uncertainty analyses in environmental risk assessments.

1971-1975 Department of Environmental Protection Institute for Reactor Safety, Cologne, Germany

1969-1971 U. S. National Park Service

1968 Fisheries Limnology, Oregon State University

Professional Affiliations

International Union of Radioecologists
International Commission on Radiological Protection.
US Environmental Protection Agency, Radiation Advisory Committee, Science Advisory Board (1992-present)
US Department of Health and Human Services, Centers for Disease Control and Prevention, Advisory Committee for Energy-Related Epidemiological Research (1992-present)
State of Colorado, Department of Health, Health Advisory Panel for Dose Reconstruction at Rocky Flats
International Union of Radioecologists: Board of Directors
Journal of Radioecology: Editorial Board
Society of Environmental Toxicology and Chemistry

Hoffman, F.O. continued

Professional Affiliations continued

The George Wright Society
U. S. National Council on Radiation Protection and Measurements (1992-present)
Scientific Committee 64-17 (chair): Implementing Quantitative Uncertainty Analysis When Data are Sparse (1992-present).
Scientific Committee 64-16 (chair): Analysis of Uncertainty in Screening Models (1990-present)

Professional Societies

Society for Risk Analysis
Health Physics Society

Publications

Hoffman, F.O. 1998. Advances in environmental dose reconstruction. ASA Conference on Radiation and Health June 14-17, 1998. (Abstract)

NCRP. 1998. Evaluating the reliability of biokinetic and dosimetric models and parameters used to assess individual doses for risk assessment purposes. NCRP Commentary No. 15. Prepared by Scientific Committee 57-16 on Uncertainty in the Application of Metabolic Models: A. Bouville, K.F. Eckerman; W.C. Griffith, F.O. Hoffman, R.W. Leggett, and J. Stubbs. June 1998.

Kryshev, I.I., Sazykina, T.G., Hoffman, F.O., Thiessen, K.M., Blaylock, B.G., Feng, Y., Galeriu, D., Heling, R., Kryshev, A.I., Kononovich, A.L., and Watkins, B. In press. Assessment of the consequences of the radioactive contamination of aquatic media and biota for the Chernobyl NPP cooling pond: Model testing using Chernobyl data. *Journal of Environmental Radioactivity.*

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Apostoaei, A.I., Nair, S.K., Thomas, B.A., Hammonds, J.S., and Hoffman, F.O. 1998. External Exposure to Finite Contaminated Surfaces with Application of Riverine Shorelines. *Transactions of the American Nuclear Society* 79:49. June 7-11, 1998. Nashville, Tennessee.

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Garger, E.K., Hoffman, F.O., Thiessen, K.M., Galeriu, D. Kryshev, A.I., Lev, T., Miller, C.W., Nair, S.K., Talerko, N., and Watkins, B. In Press. Test of existing mathematical models for atmospheric resuspension of radionuclides. *Journal of Environmental Radioactivity*

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Hammonds, J.S., Hoffman, F.O., Apostoaei, A.I., Thiessen, K.M., Lewis, C.J., Blaylock, B.G., Caldwell, B., Flack, S., Nair, S.K., Reed, E.W., Thomas, B.A., and Widner, T.E. 1997. Radionuclides released from White Oak Creek on the Oak Ridge Reservation to the Clinch River: A reconstruction of historical quantities released, off-site doses, and health risks. Oak Ridge Health Studies, Oak Ridge Dose Reconstruction. November 1997.

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Peterson, S.R., Hoffman, F.O., and Köhler, H. 1996. Summary of the BIOMOVS A4 Scenario: Testing Models of the Air-Pasture-Cow Milk Pathway Using Chernobyl Fallout Data. *Health Physics* 71(2):149-159.

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Schmoyer, R.L., Beauchamp, J.J., Brandt, C.C., and Hoffman, F. O. 1996. Difficulties with the lognormal model in mean estimation and testing. *Environmental and Ecological Statistics* 3:81-97.

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Hoffman, F.O., Apostoaei, A.I., Nair, S.K., Widner, T.E., and Burns, R.E. 1996. First Iteration Dose and Health Risk Assessment for ^{131}I from X-10 Radioactive Lanthanum Processing. Oak Ridge Health Studies, Oak Ridge Dose Reconstruction. State of Tennessee.

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Hoffman, F.O. continued

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Bouville, A., Eckerman, K., Griffith, W., Hoffman, O., Leggett, R., and Stubbs, J. 1994. Evaluating the reliability of biokinetic and dosimetric models and parameters used to assess individual doses for risk assessment purposes. *Radiation Protection Dosimetry* 53(1-4):211-215.

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MacIntosh, D.L., Suter II, G.W., and Hoffman, F.O. 1992. Model of the PCB and mercury exposure of mink and great blue heron inhabiting the off-site environment downstream from the U. S. Department of Energy Oak Ridge Reservation. Oak Ridge National Laboratory Report. September 1992. ORNL/ER-90.

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Blaylock, B.G., Frank, M.L., Hook, L.A., Hoffman, F.O., and Ford, C.L. 1992. White Oak Creek Embayment site characterization and contaminant screening report. Oak Ridge National Laboratory Report. ORNL/ER-81.

Shevenell, L., Hoffman, F.O., and MacIntosh, D. 1992. Re-ranking of ORNL WAGs: Prioritization based on risk assessment calculations using MEPAS, an accepted screening methodology, and an uncertainty analysis. Oak Ridge National Laboratory Report. ORNL/ER-53.

Shevenell, L., and Hoffman, F.O. 1992. Suggestions for improvement of the methodology and use of MEPAS. Oak Ridge National Laboratory Report. ORNL/ER-47.

Blaylock, B.G., Hoffman, F.O., and Frank, M.L. 1992. Preliminary screening of contaminants in the off-site surface water environment downstream of the US Department of Energy Oak Ridge Reservation. In: Proceedings of Environmental Surveillance and Data Analysis Interpretation. Oak Ridge National Laboratory.

Hoffman, F.O. continued

Graham, R.V., Blaylock, B.G., Hoffman, F.O., and Frank, M.L. 1991. Comparison of selenomethionine and selenite in a freshwater pond. *Water, Air, and Soil Pollution* 62:25-42.

Köcher, D.C., and Hoffman, F.O. 1991. Regulating environmental carcinogens: where do we draw the line? *Environmental Science and Technology* 25: 1986-1989.

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Hoffman, F.O., Gardner, R.H., and Bartell, S.M. 1986. The significance of environmental exposure pathways for technetium. In: Technetium in the Environment, Myttenaere, C. and Desmet, G. (eds.). Elsevier Applied Science, London. 359-376.

Hoffman, F.O., Bergström, U., Gyllander, C., and Wilkens, A. 1984. A comparison of predictions from internationally recognized assessment models for the transfer of selected radionuclides through terrestrial food chains. *Nuclear Safety* 25:533-546.

Garten, C.T., Hoffman, F.O., and Bondietti, E.A. 1984. Field and greenhouse experiments on the fate of technetium in plants and soil. *Health Physics* 46: 647-656.

Hoffman, F.O., Blaylock, B.G., Travis, C.C., Daniels, K.L., Etnier, E.L., Cowser, K.E., and Weber, C.W. 1984. Preliminary screening of contaminants in sediments. Oak Ridge National Laboratory Report. ORNL/TM-9370; ESD-2400.

Hoffman, F.O., Miller, C.W., and Ng, Y.C. 1984. Uncertainties in environmental radiological assessment models and their implications. In: Environmental Transfer to Man of Radionuclide Releases from Nuclear Installations, Commission of the European Communities, Luxembourg.

Hoffman, F.O. continued

Hoffman, F.O., Witherspoon, J.P., and Waite, D.A. 1984. Uncertainties in assessment models In: Radiological Assessment: Predicting the Transport, Bioaccumulation, and Intake by Man of Radionuclides Released to the Environment. Report of NCRP Scientific Committee-64.. Bethesda, Maryland.

Bondietti, E.A., Hoffman, F.O., and Larsen I.L. 1984. Air-to-vegetation transfer rates of natural submicron aerosols. *Journal of Environmental Radioactivity* 1:5-28

Hoffman, F.O., and Miller, C.W. 1983. Uncertainties in environmental radiological assessment models and their implications. In: Environmental Radioactivity, The Proceedings of the Nineteenth Annual Meeting of the National Council on Radiation Protection and Measurements, April 6, 1983. Washington, D.C. 110-138.

Hoffman, F.O., and Gardner, R.H. 1983. Evaluation of uncertainties in radiological assessment models. In: Radiological Assessments (J.E. Till and H.R. Meyer, eds.). Washington, D.C., U.S. Nuclear Regulatory Commission. NUREG/CR-3332, ORNL-5968.

Miller, C.W., and Hoffman, F.O. 1983. An examination of the environmental half-time for radionuclides deposited on vegetation. *Health Physics* 45:731-744.

Hoffman, F.O., Gardner, R.H., and Eckerman, K.F. 1982. Variability in dose estimates associated with the food chain transport and ingestion of selected radionuclides. Oak Ridge National Laboratory Report. NUREG/CR-2612; ORNL/TM-8099.

Hoffman, F.O., Garten, Jr., C.T., Huckabee, J.W., and Lucas, D.M. 1982. Interception and retention of technetium by vegetation and soil. *Journal of Environmental Quality* 11:134-241.

Hoffman, F.O., Garten, C.T., Jr., Lucas, D.M., and Huckabee, J.W. 1982. Environmental behavior of technetium in soil and vegetation. *Environmental Science and Technology* 16:214-217.

IAEA. 1982. Generic models and parameters for assessing the environmental transfer of radionuclides from routine releases. Safety Series No. 57. International Atomic Energy Agency, Vienna.

Schwarz, G., and Hoffman, F.O. 1981. Imprecision of dose predictions for radionuclides released to the environment: An application of a Monte Carlo simulation technique. *Environment International* 4:289-297.

Hoffman, F.O, and Donaldson, J.R. 1979. The significance of Crater Lake National Park as a scientific benchmark for limnological research, In: Proceedings of the First Conference on Scientific Research in the National Parks, New Orleans, Louisiana, Nov. 9-13, 1976.

Hoffman, F.O., and Baes III, C.F. (eds.). 1979. A statistical analysis of selected parameters for predicting food chain transport and internal dose of radionuclides. ORNL/NUREG/TM-282.

Hoffman, F.O. 1979. Bioaccumulation factors for freshwater fish, Bip, In: A statistical analysis of selected parameters for predicting food chain transport and internal dose of radionuclides (Hoffman, F.O., and Baes, C.F., III, eds.). ORNL/NUREG/TM-282.

Hoffman, F.O. 1978. A review of measured values of the milk transfer coefficient (f_m) for iodine. *Health Physics* 35:413-416.

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Hoffman, F.O., Miller, C.W., Shaeffer, D.L., and Garten, Jr., C.T. 1978. Computer codes for the assessment of radionuclides released to the environment. *Nuclear Safety* 18:343-354.

Hoffman, F.O.1974. Wärmebelastbarkeit des Rheins abhangig von Wasserverschmutzung (Water pollution determines the thermal capacity for the river Rhine). *Umschau* 21:667-668.

Hoffman, F.O. 1973. Ein Überblick uber die Ergebnisse und Voraussagen des Wärmelastplan des Rheins (A review of the results and predictions contained in the 'Wärmelastplan Rhein'). *Technische Überwachung* 14:147-149.

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Glenn Paulson, Ph.D.

Paulson and Cooper, Inc.

Sent from:
Illinois Office
505 North Lake Shore Drive, Suite 3404
Chicago, IL 60611-6426
Phone 312 527 3980
Fax 312 527 3990

Wyoming Office
PO Box 1541, 242 East Broadway
Jackson Hole, WY 83001-1541
Phone 307 734 0350
Fax 307 734 0248

FAX TRANSMITTAL

DATE: Tuesday, December 01, 1998
TO: Carla Sanda
FROM: Glenn Paulson
NUMBER OF PAGES (INCLUDING THIS COVER PAGE): 3

Following is the brief resume I promised you. If the transmission is not clear enough, please call me at our Chicago office and I will mail you one. I am most interested in the assignment you discussed.

I will be based in our Chicago office though Friday, Dec. 11th, and, after a several day business trip to Casper, then in our Jackson office from Dec. 16th until mid-January. A phone message to either office will reach me promptly no matter where I am based, of course.

If you need assistance in reaching the other individuals I mentioned, let me know later this week, and please tell Ken Korkia I appreciate being a candidate for this task.

BRIEF RESUME OF GLENN PAULSON, PH.D., SC.D. (HON.)

Areas of expertise

Hazardous and radioactive waste management (including Superfund in particular); air and water pollution control; environmental chemistry, toxicology, and policy.

Experience Summary

Current position (1992-present): President, Paulson and Cooper, Inc., an environmental consultancy founded in 1992, with offices in Chicago, Illinois and Jackson Hole, Wyoming; clients include corporations, law firms, universities, not-for-profit research institutions, and citizen groups.

Prior positions: Illinois Institute of Technology, Chicago, IL: Research Professor, Department of Environmental Engineering, 1988-1995; Director, The Center for Hazardous Waste Management, 1988-92. Clean Sites, Inc., Alexandria, VA: Vice President, 1984-88. National Audubon Society, New York, NY: Senior Vice President, 1983-84; Vice President, 1979-83. New Jersey Department of Environmental Protection, Trenton, NJ: Assistant Commissioner, 1974-79. Natural Resources Defense Council, Inc., New York, NY: Administrator, Scientific Support Program, 1973-74; Staff Scientist, 1971-73.

Dr. Paulson has nearly 30 years of professional experience in virtually all aspects of environmental science and policy, ranging from natural resource management and endangered species research to the assessment and cleanup of over 100 Superfund sites, some involving radioactive wastes. While Assistant Commissioner in the New Jersey Department of Environmental Protection, Dr. Paulson was one of the prime authors of the New Jersey Superfund law, a comprehensive statute that predated the first U. S. Superfund law by several years. He was also Chief Radiation Officer for the State of New Jersey, involved in radiation safety and radioactive waste matters at nuclear power plants and other facilities. These included involvement in state and federal nuclear power plant licensing proceedings, managing several special reactor safety studies on the operating nuclear power reactors in New Jersey, and carrying out, jointly with the State Police, New Jersey's response to the Three Mile Island accident.

Professional Affiliations and Accomplishments (partial list)

Elected Fellow, American Association for the Advancement of Science and the American Institute of Chemists; Former Member, National Academy of Sciences Board on Radioactive Waste Management and member of many Academy study panels; Member, Office of Technology Assessment Advisory Panels on high level radioactive wastes and waste management at the Department of Energy's (DOE) production facilities; Charter Member, Secretary of Energy Advisory Board; First Chairman, Environmental Management Advisory Board (DOE); Member of the following societies and organizations: American Chemical Society, National Association of Ground Water Scientists and Engineers, Society for Environmental Toxicology and Chemistry, Society for Risk Assessment, Phi Beta Kappa, Sigma Xi, and Phi Lambda Upsilon. Included in American Men and Women of Science and Who's Who in America.

Relevant Publications

Expert Report of Glenn Paulson, Ph.D., submitted in regard to *Eleanor F. Wilson, et al. vs. Amoco Corporation, et al.* (Court No. 96-CV-124B, US District Court, District of Wyoming), April 6, 1998 (33 pages). Also available from Paulson and Cooper, Inc.

Paulson, G., Two reports in Safety Controls Optimization by Performance Evaluation Expert Elicitation Results for Hanford Site Single-Shell Tanks, S. C. Slezak and D. R. Bratzel, eds., US Department of Energy, Richland, WA, 1997 and 1998 (also available from Paulson and Cooper, Inc.)

Paulson, G., F. Parker and M. Kavanaugh, Technical Team Review of the Proposed New Double Shell Tanks at Hanford, Paulson and Cooper, Inc., Jackson Hole, WY, 1995, also available from the Hanford Advisory Board (a summary version of this report is also found in the Proceedings of the Waste Management '96 conference)

McCarty, P., et al., Ranking Hazardous Waste Sites, National Academy of Sciences, National Academy Press, Washington, DC (1994)

Paulson, G. et al., A Technical, Legal and Policy Study of Superfund, The Center for Hazardous Waste Management, Illinois Institute of Technology/IIT Research Institute, 1989 (5 volumes)

Cohrssen, J., G. Paulson and R. Dowd, Report of an Expert Meeting on Research Needs and Opportunities at Federally-Supervised Hazardous Waste Site Clean-Ups, President's Council on Environmental Quality, The White House, Washington, DC, October, 1986 (21 pages)

Paulson, G., Nuclear Energy: Section 4, Environmental and Health Hazards, in Vol. 20, Encyclopedia Americana, Grolier Publishing Company, New York, NY, pages 511t-511v (1974)

See also

Complex Cleanup, Office of Technology Assessment, Congress of the United States, Washington, DC (1991)

Managing the Nation's Commercial High-Level Radioactive Waste, Office of Technology Assessment, Washington, DC (1985)

Education

Ph.D. in Environmental Sciences and Ecology, The Rockefeller University, New York, NY, [redacted] under Prof. Rene Dubos; B.A. in Chemistry (with Honors), Northwestern University, Evanston, IL, [redacted]

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Paula A. Labieniec, Ph.D.

Paula A. Labieniec

[redacted]

EDUCATION

Ph.D. Dept. of Civil and Environmental Engineering and Dept. of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA, [redacted]

Thesis title: *The Risk Implications of Approaches to Setting Soil Remediation Goals at Hazardous Waste Contaminated Sites*

Summary: Developed an integrated risk model for contaminated soil. Evaluated the impact of uncertainty in site-specific risk assessments on estimated human health risk levels, and the effect of variability in site conditions on variability in risk when a uniform, concentration-based soil remediation goal is considered.

Advisors: David A. Dzombak and Robert L. Siegrist (Colorado School of Mines, Golden, CO)

Course work: health physics, radiation sciences, groundwater hydrology and chemistry, inorganic and organic aquatic chemistry, and risk analysis and management.

M.S. Dept. of Civil and Environmental Engineering and Dept. of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA, [redacted]

Thesis title: *Identification of the Direct Distribution Model from Regionalized Mechanistic Models of Aquatic Acidification.*

Summary: Developed a procedure to allow a simple empirical model of regional lake acidification to serve as a summary representation of more complex mechanistic models.

Advisor: Mitchell J. Small

Course work: environmental engineering and science, contaminant transport modeling, economics, policy and decision analysis, and probability and statistics.

B.S. Chemistry with minor in Biology, State University of New York, College at Oswego, Oswego, NY, [redacted]

POSITIONS

1997-present *Independent Consultant*, Chesterfield, VA. In the area of hazardous waste and contaminated soil risk assessment, with focus on source-term and environmental fate and transport model components. Involved as sub-contractor in EPA Office of Solid Waste's effort to set Hazardous Waste Identification Rule (HWIR) levels for solid waste disposal.

1990-1994 *Research Assistant*, Carnegie Mellon University, Dept. of Civil and Environmental Engineering and Dept. of Engineering and Public Policy, Pittsburgh, PA. Performed research, including software development, in the areas of contaminant fate and transport and human health exposure/risk assessment. Provided review and evaluation of legislation and regulation establishing environmental quality criteria, particularly soil quality criteria.

1991 *Research Assistant*, Oak Ridge National Laboratory, Environmental Sciences Division, Environmental Engineering Group, Oak Ridge, TN. During summer practicum, reviewed existing procedures for contaminated soil assessment and their use in setting soil remediation goals at hazardous waste sites.

1989-1990 *Environmental Planning Consultant*, Allegheny County Planning Department, Pittsburgh, PA. Managed development of regional water and sewer plan. Analyzed environmental

legislation and regulation for impacts on County. Acted as liaison between County and local environmental groups.

1989 *Consultant*, Consad Research Corporation, Pittsburgh, PA. Researched and wrote summaries of the economic environment in Southeast Asia and Eastern Europe.

1987-1988 *Teaching Assistant*, Carnegie Mellon University, Dept. of Engineering and Public Policy, Pittsburgh, PA. For 'Technology and People', a required freshman course. Co-authored unit titled 'Reliability of Complex Engineered Systems' for use in course. Document produced includes explanations of concepts as well as examples and exercises.

1987 *Project Manager*, Carnegie Mellon University, Dept. of Engineering and Public Policy, Pittsburgh, PA. For undergraduate engineering and policy course on economic, technological, and societal issues related to drug testing in the workplace. Managed team of 25 students. Provided research guidance and coordinated the publication of a final report and presentation of results to an outside review panel.

1985-1986 *Field Manager*, Clean Water Action Project, Pittsburgh, PA. Managed and trained canvassers in environmental issues and fund-raising efforts.

1985 *Analytical Chemist*, Sandoz, Inc., Sandoz Research Institute, Bioanalytics Division, East Hanover, NJ. Developed and validated drug analysis methodologies.

AWARDS AND HONORS

- U.S. Department of Energy Environmental Restoration and Waste Management Fellow, Carnegie Mellon University, 1990-1993
- County of Allegheny Community Citation of Merit, Pennsylvania, 1991.
- American Institute of Chemists' Senior Award, SUNY-Oswego, 1984.
- American Chemical Society Award in Analytical Chemistry, SUNY-Oswego, 1983.
- Oswego Alumni Scholar, SUNY-Oswego, 1983.
- Presidents List, SUNY-Oswego, 1980-1983.

PROFESSIONAL AFFILIATIONS

- American Chemical Society
- American Society of Civil Engineers
- Water Environment Federation

PROFESSIONAL ACTIVITIES

1998 Reviewed manuscript for Advances in Environmental Research.

1997 Reviewed manuscript for Environmental Science and Technology.

1996 Reviewed manuscript for the Journal of the Air and Waste Management Association.

1995-1996 Member, Groundwater Committee, Water Environment Federation.

1995-1996 Seminar Co-chair, Ecological Risk Assessment Workshop, Water Environment Federation 1996 Conference (WEFTEC '96), Dallas, TX, October 1996.

1995 Member, Panel for Review of Soil Quality Criteria, Bureau of Waste Management, Pennsylvania Department of Environmental Protection, Harrisburg, PA.

1989-1990 Member, Environmental Systems Task Force for the Airport Area Development Advisory Commission, Allegheny County, Pittsburgh, PA.

RESEARCH INTERESTS

- Establishing remediation goals in hazardous waste site remediation.
- Fate and transport of pollutants in subsurface systems.
- Human health and ecological risk analysis of environmental contamination.
- Incorporating variability and uncertainty into environmental modeling.
- Developing quantitative tools to evaluate environmental policy options.

PUBLICATIONS - JOURNAL ARTICLES

Labieniec, P.A. (1998) Commentary on Fate and Exposure Models: Application of SoilRisk to a Hypothetical Site. J. of Soil Contamination, 7(3):311-317.

Labieniec, P. A., Dzombak, D. A., and Siegrist, R. L. (1997). Quantitative Evaluation of Uncertainty in a Site Specific Risk Assessment. J. of Environ. Eng., 123(3), 234-243.

Labieniec, P. A., Dzombak, D. A., and Siegrist, R. L. (1996). Establishing and Evaluating the Risk Implications of Uniform Soil Remediation Goals. J. of Air and Waste Mgt. Assn., 48, 1179-1184.

Labieniec, P. A., Dzombak, D. A., and Siegrist, R. L. (1996). Risk Variability due to Uniform Soil Remediation Goals. J. of Environ. Eng., 122(7), 612-621.

Labieniec, P. A., Dzombak, D. A., and Siegrist, R. L. (1996). SoilRisk: Risk Assessment Model for Organic Contaminants in Soil. J. Environ. Eng., 122(5), 388-398.

Labieniec, P. A., Dzombak, D. A., and Siegrist, R. L. (1994). Risk Variability from Uniform Soil Remediation Goals for PCBs. J. Environ. Eng., 120(3), 495-512.

PUBLICATIONS - EDITORIALS

Dzombak, D.A., Labieniec, P.A., and Siegrist, R.L. (1993). The Need for Uniform Soil Cleanup Goals. Environ. Sci. Technol., 27(5): 765-766.

PUBLICATIONS - BOOK CHAPTERS

Small, M.J. and Labieniec, P.A. (1990). Identification of a Direct Distribution Model from a Regionalized Mechanistic Model of Aquatic Acidification. In J. Kamari, Ed., Impact Models to Assess Regional Acidification, Kluwer Academic Publishers, Boston, pp.167-181.

Labieniec, P.A., Small, M.J., and Cosby, B. (1989). Regional Distributions of Lake Chemistry Predicted by Mechanistic and Empirical Lake Acidification Models. In J. Kamari, D.F. Brakke, A. Jenkins, S.A. Norton, R.F. Wright., Eds., Regional Acidification Models: Geographic Extent and Time Development, Springer-Verlag, New York, pp. 185-201.

Small, M.J., Sutton, M.C., and Labieniec, P.A. (1987). Modeling Distributions of Aquatic Chemistry in Regions Impacted by Acid Deposition. In M.B. Beck, Ed., Systems Analysis in Water Quality Management, Pergammon Press, Oxford, pp.161-172.

PUBLICATIONS - PEER REVIEWED CONFERENCE PROCEEDINGS

Peters, C. A., Labieniec, P. A., and Knightes, C. D. (1996). Multicomponent NAPL Composition Dynamics and Risk. To appear in American Society of Civil Engineers (ASCE) 1996 National Convention Conference Proceedings November, 1996 Washington, DC: ASCE.

PUBLICATIONS - CONFERENCE PROCEEDINGS

Labieniec, P.A. (1996). Overview of States' Requirements for Ecological Risk Assessment. In Ecological Risk Assessment: An Important Tool in Environmental Decision Making (Based on an October 1996 Workshop), Water Environment Federation, Alexandria, VA.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R.L. (1993). Risk Implications of Approaches to Setting Soil Remediation Goals. In Proceedings of the Specialty Conference on the Development of Soil, Sediment, and Groundwater Cleanup Standards for Contaminated Sites: How Clean is Clean?, Water Environment Federation, Alexandria, VA.

PUBLICATIONS - REPORTS

Labieniec, P. A. (1995). User's guide for SoilRisk: A Risk Assessment Model for Organic Contaminants in Soil (Version 1.0) (R95216). Dept. of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA.

SOFTWARE

Labieniec, P.A. and Dzombak, D.A (1994). SoilRisk: A Risk Assessment Model for Organic Contaminants in Soil (Version 1.0). Dept. of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA.

Sutton, M.C. and Labieniec, P.A. (1987). The Direct Distribution Model. Dept. of Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA.

PRESENTATIONS

Labieniec, P.A. (1996). Overview of States' Requirements for Ecological Risk Assessment. Presented at Water Environment Federation WEFTEC'96 Annual Conference Workshop: Ecological Risk Assessment: An Important Tool in Environmental Decision Making, Dallas, TX, October 1996.

Labieniec, P.A. (1995). SoilRisk, A Risk Assessment Model for Organic Contaminants in Soil: Description and Potential Utility in Setting Statewide Health Standards for Soil in PA. Presented to the Panel for the Review of Soil Quality Criteria, PA Department of Environmental Protection, Harrisburg, PA, June 1995.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R. L. (1994). Quantitative Evaluation of the Risk Implications of Approaches to Establishing Soil Remediation Goals. Presented at the Ninth Annual Conference on Contaminated Soils, University of Massachusetts, Amherst, MA, October 1994.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R.L. (1993). Risk Implications of Approaches to Setting Soil Remediation Goals. Presented at the Water Environment Federation Specialty Conference: Developing Cleanup Standards for Contaminated Soil, Sediment, and Groundwater: How Clean is Clean?, Washington, DC, January 1993.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R. L. (1992). Risk Variability Resulting from Uniform Remediation Goals for Soil: The Case of PCBs. Presented at The Society of Risk Analysis 1992 Annual Meeting, San Diego, CA, December 1992.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R. L. (1992). Risk Implications of Approaches to Setting Soil Remediation Goals. Poster presented (by D. Dzombak) at the Gordon Research Conference for Environmental Sciences-Water, New Hampton, NH, June 1992.

Labieniec, P.A., Dzombak, D.A., and Siegrist, R. L. (1992). Risk Implications of Approaches to Setting Soil Remediation Goals. Poster presented at the Ohio River Basin Consortium for Research and Education Eighth Annual Scientific Symposium "Multimedia Interaction of Environmental Pollutants", University of Cincinnati, Cincinnati, OH, November 1992.

Labieniec, P.A. (1991). How Clean is Clean Enough? Establishing Soil Clean Up Goals for Hazardous Waste Contaminated Land. Presented at the U.S. Department of Energy Environmental Restoration and Waste Management Graduate Fellowship Program Student Conference, Santa Fe, NM, September 1991.

Labieniec, P.A. and Small, M.J. (1987). Joint Application of Regional Acidification Models of Differing Complexity. Presented at the American Geophysical Union 1987 Fall Meeting, San Francisco, CA, December, 1987.

RFSALOP

Rocky Flats Soil Action Levels Oversight Panel

PROJECT PEER REVIEW

The Rocky Flats Soil Action Levels Oversight Panel (RFSALOP) is a citizen oversight body working as an adjunct to the Rocky Flats Citizens Advisory Board to obtain an independent scientific review of the Rocky Flats radionuclide soil action levels (RSALs) adopted in October 1996. The RFSALOP recently hired *Risk Assessment Corporation (RAC)* to perform this review. To enhance the quality and credibility of this effort, the RFSALOP now seeks competent individuals to provide peer review of *RAC's* work in the following areas, which correspond to the principal tasks in the scope of work:

1. Setting radionuclide soil action levels.
2. Analyzing RESRAD (the computer-modeling program used to set October 1996 levels) and other potentially relevant computer programs.
3. Analyzing inputs and assumptions for the RSALs.
4. Assessing independent calculations for the RSALs.
5. Analyzing soil-sampling protocols.

CRITERIA FOR MEMBERS OF PEER REVIEW TEAM

- Positive reputation and credibility in the scientific community
- Competence in one or more of the five task areas mentioned above
- Minimal conflict of interest (preferably now working outside the Department of Energy system)
- Ability to meet a set schedule with relatively quick turn around of review, with comments in writing
- Willingness to share with members of the RFSALOP any and all correspondence with the contractor

PEER REVIEW TERMS OF WORK

1. Each reviewer will be asked to review and comment on all of *RAC's* draft reports, with more detailed comments in the areas of the reviewer's particular expertise.
2. Timetable: *RAC's* draft task reports, as well as a draft final report, will be provided simultaneously to reviewers and to members of the RFSALOP. Peer reviewers will be provided a deadline for providing written comments on each draft report. Depending upon the report's length and complexity, the comment period will likely range between 30-60 days. *RAC's* final reports will reflect how they respond to comments.
3. Provisions will be made for telephone communication between reviewers and RFSALOP members when needed.
4. Honorarium: Each reviewer will be provided an honorarium of $2,000 plus incidental expenses (no travel or face-to-face meetings). Incidental expenses will be paid as accrued. The full honorarium will be paid upon completion of services.
5. Project duration: ~12 months

To confirm your interest in serving on the Peer Review Team, or to request additional clarification, please contact: Carla Sanda, Advanced Integrated Management Services, Inc., (303) 277-0753.

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1879 Denver West Drive - #1621
Golden, CO 80401
Phone: (303) 277-0753 or (303) 277-0747

Fax

To:	Hank Stovall/Ken Korkia	**From:**	Carla Sanda
Fax:	303-438-6296	**Date:**	March 2, 1999
Phone:	303-466-5986	**Pages:**	3 including cover
Re:	Materials for Peer Review Conf Call	**CC:**	

Urgent **For Review** **Please Comment** **Please Reply** **Please Recycle**

Hi Hank & Ken - Enclosed are materials for review prior to the Monday, March 8 conference call with the Peer Review Team. RSALOP Peer Review Team, which has been scheduled immediately following our steering committee meeting at the RFCAB offices. The steering committee meeting is schedule for 8:30 - 9:30, followed at 9:30 a.m. with the conference call. To provide background information for the call, please review the enclosed copies of the cover letter and letter of agreement that have been transmitted to the peer review team.

Members of the peer review team are:

- Dr. Steven L. Simon, National Academy of Sciences
- Dr. Paula Labieniec, independent consultant in hazardous waste and contaminated soil risk assessment
- Dr. Ward Whicker, Dept of Radiological Health Sciences, Colorado State University
- Allen C. B. Richardson, consultant on radiation protection and former member of the EPA staff involved in developing much of the EPA radiation standards
- Dr. Glenn Paulson, President of Paulson & Cooper, hazardous & radioactive waste management

This information on the conference call along with connection numbers has already been forwarded to members of the Peer Review Subcomittee, as well as Joe Goldfield, who expressed interest at last month's Panel meeting in participating in the call.

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February , 1999

Dear .

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

Enclosed is the final Letter of Agreement that will be discussed in our upcoming conference call. You will note that review dates have changed for the tasks since our original mailing. We sincerely hope this will not adversely impact your schedule.

To provide you with additional background information on the project, we are also enclosing the following:

- Section IV - Project Description and Scope – an excerpt from the original Request for Proposals that was issued on the project to prospective technical contractors.
- Proposal of Work - an excerpt from the winning proposal from Risk Assessment Corporation on the project
- Fact sheet entitled *"Planning for Tomorrow...Radionuclide Soil Action Levels at Rocky Flats"*

We look forward to talking with each of you at the conference call scheduled for: Monday, March 8, 1999 at 9:30 a.m. (Mountain Standard Time). You may connect to the call by dialing ***1-800-403-2004***. When asked for the "participant code", please enter ***392779***. Thank you again for your willingness to take on this important task. If you have any questions prior to the conference call, please feel free to contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Hank Stovall, Co-Chair

Mary Harlow, Co-Chair

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

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Letter of Agreement

The Rocky Flats Citizens Advisory Board (RFCAB) serves as the funds manager for the Radionuclide Soil Action Levels Oversight Panel project and related peer review process. This letter outlines the agreement between the RFCAB and Dr. X (hereafter referred to as the reviewer) towards the conduct of peer review for the Radionuclide Soil Action Levels Oversight Panel (RSALOP). The RSALOP will deliver to the reviewer four draft reports prepared by the contractor, *Risk Assessment Corporation*, as part of its work in conducting an independent assessment of the radionuclide soil action levels developed for the cleanup of the Rocky Flats Environmental Technology Site. The reviewer will assess these draft reports and prepare a written analysis for submission to the RSALOP. For timely completion of the written analyses, the RSALOP, through RFCAB, will award an honorarium, plus reimbursement for costs (e.g., phone calls, faxes, delivery services) associated with the conduct of the review. The reviewer understands that full award of the honorarium is dependent upon completion and delivery of his or her written analysis within the prescribed deadlines as outlined below:

Task 2 Report: **Computer Models**
- March 12: Draft report transmitted to reviewer
- April 2: Reviewer's written analysis delivery deadline to RSALOP

Task 6 Report: **Soil Sampling Protocols**
- May 14: Draft report transmitted to reviewer
- June 4: Reviewer's written analysis delivery deadline to RSALOP

Task 3 Report: **Inputs and Assumptions**
- July 9: Draft report transmitted to reviewer
- July 30: Reviewer's written analysis delivery deadline to RSALOP

Task 5 Report: **Independent Calculation**
- September 10: Draft reports transmitted to reviewer
- October 1: Reviewer's written analysis delivery deadline to RSALOP

As stated above, the RSALOP has established an honorarium for timely completion of the written analyses. RSALOP, through RFCAB, will award a maximum $2,000 honorarium as follows:

A full honorarium amount of $500 for each report will be awarded if the written analysis is delivered by the deadlines outlined above. Written analyses received up to seven days past the delivery deadline will result in a decreased award of $400 per report. Analyses received eight to fourteen days past the delivery deadline will result in a decreased award of $250 per report. No honorarium will be awarded for analyses received more than fourteen days past the delivery deadline.

By the signatures below, the parties acknowledge concurrence with this agreement.

_____ Date: _____

James A. Kinsinger
Chair

_____ Date: _____

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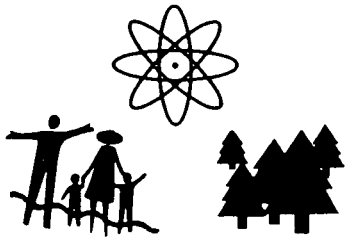
RSALOP

Radionuclide Soil Action Level Oversight Panel



RSALOP PEER REVIEW TEAM MEMBERS

Dr. Paula A. Labieniec
[redacted]

Dr. Glenn Paulson
Paulson and Cooper, Inc.
505 North Lake Shore Drive, Suite 3404
Chicago, IL 60611-6426
Ph: 312-527-3980
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Jackson Hole, WY 83001-1541
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Bondurant, WY 82922
307-859-8455

Mr. Allan C. B. Richardson
[redacted]

[redacted]

Dr. Steven L. Simon
Board of Radiation Effects Research
National Academy of Sciences
2101 Constitution Ave., NW
Washington, DC 20418
Ph: 202-334-2232 (General Office)
Ph: 202-334-1245 (Direct Line)
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Dr. Ward Whicker
2[redacted]

[redacted]

RSALOP PROJECT CONTACTS

Panel Co-Chairs

Mary Harlow, Rocky Flats Coordinator
City of Westminster
4800 W. 92nd Avenue
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Hank Stovall, Councilman
City of Broomfield
One Descombes Drive
Broomfield, CO 80020
Ph: 303-466-5986
Fax: 303-438-6296

Project Administrator - Public Involvement/Community Relations

Carla Sanda
[redacted]

Project Funds Administrator

Ken Korkia
Rocky Flats Citizens Advisory Board
9035 Wadsworth Parkway - Suite 2250
Westminster, CO 80021
Ph: 303-420-7855
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Peer Review Subcommittee

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Rocky Mountain Peace & Justice Center
PO Box 1156
Boulder, CO 80306
Ph: 303-444-6981
Fax: 303-444-6523

Email: leroymoore@earthlink.net

Peer Review Candidates

CANDIDATE	PHONE/*FAX	Y	N	C/V	DATE	REFERRAL	COMMENTS/NOTES
Dr. Owen Hoffman	[redacted]	x		x	1-Dec	Joe Shinn	[redacted]
						Dr. Steve Simon	
						Dr. William Bair	
Dr. Arjun Mahkijani		x		x	1-Dec		
					2-Dec		
Lynn Anspaugh		x		x	30-Nov		
					3-Dec		
Bernde Franke		x		x	1-Dec	Allan Richardson	
Glenn Paulson		x		x	30-Nov	Dr. Chris Whipple	
						Dr. Werner North	
Bruce Church		x			12/01/12/15		
Dr. Mitchell Small		x		x	1-Dec	Paula Labieniec	
Dr. Ward Whicker		x		x	11/30/12/1/12/2		
REFERRALS							
Joe Shinn - Couldn't obt	r						
Dr. Steve Simon		x		x	2-Dec		
ssimon@nas.edu							

Peer Review Candidates

Dr. William Bair	[redacted]	x		x	2-Dec	
(Richland, WA)						
Allen Richardson		x		x	2-Dec	
sarich@bellatlantic.net						
Paula Labieniec		x		x	2-Dec	
plabieniec@mindspring.c						
Dr. Chris Whipple			x	N/A	2-Dec	
Dr. Warner North		x		x	2-Dec	
wnorth@talus.net						
Dr. Genevieve Roessler		x		x	15-Dec	
gnrsslr@frontiernet.net						
Thomas E. Potter		x		x	15-Dec	
John W. Healy			x	N/A	17-Dec	
Marvin W. Goldman				x	17-Dec	
Mgoldman@ucdavis.edu						
Merril Eisenbud			x	N/A	17-Dec	

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Peer Review Candidates

Dade Moeller	[redacted]	x		x	17-Dec		
Bill Mills		x		x			
Henry Morton				x	17-Dec		[redacted]
Tom Potter		x		x	17-Dec		
Paul Ziemer		?		x	17-Dec		

Letter of Agreement

The Rocky Flats Citizens Advisory Board (RFCAB) serves as the funds manager for the Radionuclide Soil Action Levels Oversight Panel project and related peer review process. This letter outlines the agreement between the RFCAB and Dr. X (hereafter referred to as the reviewer) towards the conduct of peer review for the Radionuclide Soil Action Levels Oversight Panel (RSALOP). The RSALOP will deliver to the reviewer four draft reports prepared by the contractor, *Risk Assessment Corporation*, as part of its work in conducting an independent assessment of the radionuclide soil action levels developed for the cleanup of the Rocky Flats Environmental Technology Site. The reviewer will assess these draft reports and prepare a written analysis for submission to the RSALOP. For timely completion of the written analyses, the RSALOP, through RFCAB, will award an honorarium, plus reimbursement for costs (e.g., phone calls, faxes, delivery services) associated with the conduct of the review. The reviewer understands that full award of the honorarium is dependent upon completion and delivery of his or her written analysis within the prescribed deadlines as outlined below:

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As stated above, the RSALOP has established an honorarium for timely completion of the written analyses. RSALOP, through RFCAB, will award a maximum $2,000 honorarium as follows:

A full honorarium amount of $500 for each report will be awarded if the written analysis is delivered by the deadlines outlined above. Written analyses received up to seven days past the delivery deadline will result in a decreased award of $400 per report. Analyses received eight to fourteen days past the delivery deadline will result in a decreased award of $250 per report. No honorarium will be awarded for analyses received more than fourteen days past the delivery deadline.

By the signatures below, the parties acknowledge concurrence with this agreement.

James A. Kinsinger
Chair

Date: 1 Apr 99

Dr. Paula Labieniec

Date: 3/8/99

143

February 25, 1999

Dr. Paula A. Labieniec
[redacted]

Dear Dr. Labieniec:

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

Enclosed is the final Letter of Agreement that will be discussed in our upcoming conference call. You will note that review dates have changed for the tasks since our original mailing. We sincerely hope this will not adversely impact your schedule.

To provide you with additional background information on the project, we are also enclosing the following:

- Section IV - Project Description and Scope -- an excerpt from the original Request for Proposals that was issued on the project to prospective technical contractors.
- Proposal of Work - an excerpt from the winning proposal from Risk Assessment Corporation on the project
- Fact sheet entitled *"Planning for Tomorrow...Radionuclide Soil Action Levels at Rocky Flats"*

We look forward to talking with each of you at the conference call scheduled for: Monday, March 8, 1999 at 9:30 a.m. (Mountain Standard Time). You may connect to the call by dialing ***1-800-403-2004***. When asked for the "participant code", please enter ***392779***. Thank you again for your willingness to take on this important task. If you have any questions prior to the conference call, please feel free to contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Hank Stovall
Hank Stovall, Co-Chair cs

Mary Harlow
Mary Harlow, Co-Chair cs

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

144

January 27, 1999

Dr. Paula A. Labieniec
[redacted]

Dear Dr. Labieniec:

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The Panel was formed in 1998 as a citizen oversight panel and has hired Risk Assessment Corporation to provide the scientific review of the process and methodologies used to set the RSALs for Rocky Flats. Work began in October 1998 and is scheduled for completion November 1999. The scientific review involves various work tasks, for which *RAC* will produce separate written reports. The Panel has determined that four of these draft task reports are candidates for peer review. (Note: A copy of the original Request for Proposals and the proposal submitted by *RAC* will be sent under separate cover to provide you with additional information on the project.)

The Panel has developed the following process for timely conduct of the peer review:

- The first step is the delivery of the draft task report from *RAC* to the Panel. Following an oral presentation by *RAC*, the Panel will transmit the draft document to the Peer Review team, along with any comments or questions to which they would like the Peer Reviewers to pay particular attention.
- For the first two draft reports, Task 6 (Soil Sampling Protocols), which is due from *RAC* on April 8 and Task 2 (Computer Models), which is due on June 8, the Peer Reviewers will have approximately three weeks to review and deliver to the Panel a written analysis.
- The final two task reports, Tasks 3 (Inputs and Assumptions) and 5 (Independent Calculation), are due from *RAC* on August 8. Because of the interrelationship between these two tasks, they have been combined for the purpose of the peer review, and a timeframe of four weeks will be allowed for the review and delivery of a written analysis.

To ensure the integrity of the peer review process and the independence of each reviewer, we ask that each reviewer advise the Panel details (e.g., time, topic, specific content) of any and all communication in the period covered by the peer review process between said reviewer and any personnel connected with *RAC*, DOE-Rocky Flats, EPA Region VIII, CDPHE, or Kaiser-Hill and its subcontractors.

An honorarium has been established for your work. A maximum of $2,000 will be awarded to each reviewer who completes his/her work within the scheduled timeframe. Because of the necessity to complete the independent assessment on schedule, it is vital that the Peer Review be conducted in a timely manner. Therefore, a sliding honorarium scale has been developed:

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- For Task 6, completion of the review and submittal of a written analysis by the due date will result in an award of $500. The award for analyses received up to seven days past the scheduled delivery date will decrease to $400. The award for analyses received up to fourteen days past the scheduled delivery date will decrease to $250. Any analyses received past fourteen days will still be accepted, but no honorarium will be awarded.
- The same delivery and honorarium schedule applies for Task 2.
- By combining Tasks 3 and 5, a total honorarium of $1,000 will be awarded for written analyses received within the deadline. Analyses received up to seven days after the deadline will decrease the honorarium to $800. Reviews received eight to fourteen days past the deadline will reduce the honorarium to $500. Again, no honorarium will be awarded for analyses received past fourteen days.
- Because of the need for *RAC* to submit its final reports on schedule, late analyses will severely impact the work schedule. It is hoped that each Peer Reviewer will strive to work within the deadlines to the maximum benefit of this important assessment. To that end, analyses received before deadlines will be greatly appreciated.
- Besides the honorarium, expenses incurred by the reviewers will be reimbursed for items such as long distance phone calls, copying, faxes and delivery services. Each reviewer will submit an invoice specifying these reimbursable costs upon completion of each review task.

To help answer any of your questions and to allow you to speak with the Co-Chairs and other interested Panel members before the review process starts, a conference call will be scheduled for early March. You will be contacted before that time to determine your availability.

Finally, a letter of agreement between yourself and the Rocky Flats Citizens Advisory Board, the organization which is managing the funds for the independent assessment, will need to be signed. This letter stipulates the analysis report deadlines and the honorarium agreement. A draft copy of the letter is enclosed for your review. Some details regarding dates and deadlines may be changed in the final copy of this letter. Hence, the final copy will be transmitted for your signature following the March conference call and before delivery of the first task report.

The Panel genuinely appreciates your willingness to take on this important task. If you agree to undertake this work, please contact the project administrator, Carla Sanda at (303) 277-0753 by February 5, 1999. If you have any questions about the project, please contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Original Signed By
Hank Stovall, Co-Chair

Original Signed By
Mary Harlow, Co-Chair

Enclosure:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RFSALOP Members

146

Letter of Agreement

The Rocky Flats Citizens Advisory Board (RFCAB) serves as the funds manager for the Radionuclide Soil Action Levels Oversight Panel project and related peer review process. This letter outlines the agreement between the RFCAB and Dr. X (hereafter referred to as the reviewer) towards the conduct of peer review for the Radionuclide Soil Action Levels Oversight Panel (RSALOP). The RSALOP will deliver to the reviewer four draft reports prepared by the contractor, *Risk Assessment Corporation*, as part of its work in conducting an independent assessment of the radionuclide soil action levels developed for the cleanup of the Rocky Flats Environmental Technology Site. The reviewer will assess these draft reports and prepare a written analysis for submission to the RSALOP. For timely completion of the written analyses, the RSALOP, through RFCAB, will award an honorarium, plus reimbursement for costs (e.g., phone calls, faxes, delivery services) associated with the conduct of the review. The reviewer understands that full award of the honorarium is dependent upon completion and delivery of his or her written analysis within the prescribed deadlines as outlined below:

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By the signatures below, the parties acknowledge concurrence with this agreement.

James A. Kinsinger
Chair

Date: 1 Apr 99

Glenn Paulsen

Date: March 8, 1999

Dr. Glenn Paulson

147

February 25, 1999

Dr. Glenn Paulson
Paulson and Cooper, Inc.
505 North Lake Shore Drive, Suite 3404
Chicago, IL 60611-6426

Dear Dr. Paulson:

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

Enclosed is the final Letter of Agreement that will be discussed in our upcoming conference call. You will note that review dates have changed for the tasks since our original mailing. We sincerely hope this will not adversely impact your schedule.

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Sincerely,

Hank Stovall, Co-Chair

Mary Harlow, Co-Chair

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

148

February 10, 1999

Dr. Glenn Paulson
Paulson and Cooper, Inc.
505 North Lake Shore Drive, Suite 3404
Chicago, IL 60611-6426

Dear Dr. Paulson:

The Rocky Flats Soil Action Levels Oversight Panel ("the Panel") has selected you to serve as a Peer Reviewer for the independent scientific review of the radionuclide soil action levels (RSALs) that were set by the Department of Energy, Environmental Protection Agency, and the Colorado Department of Health & Environment for the cleanup of the Rocky Flats Environmental Technology Site. The Panel has selected five peer reviewers reflecting a variety of backgrounds relevant to the Rocky Flats study.

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- For the first two draft reports, Task 6 (Soil Sampling Protocols), which is due from *RAC* on April 8 and Task 2 (Computer Models), which is due on June 8, the Peer Reviewers will have approximately three weeks to review and deliver to the Panel a written analysis.
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To ensure the integrity of the peer review process and the independence of each reviewer, we ask that each reviewer advise the Panel details (e.g., time, topic, specific content) of any and all communication in the period covered by the peer review process between said reviewer and any personnel connected with *RAC*, DOE-Rocky Flats, EPA Region VIII, CDPHE, or Kaiser-Hill and its subcontractors.

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The Panel genuinely appreciates your willingness to take on this important task. If you have any questions about the project, please contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Hank Stovall cs
Hank Stovall, Co-Chair

Mary Harlow cs
Mary Harlow, Co-Chair

Enclosure:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RFSALOP Members

150

DRAFT

Letter of Agreement

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Task 6 Report:	Soil Sampling
April 9:	Draft report transmitted to reviewer
April 30:	Reviewer's written analysis delivery deadline to RSALOP
Task 2 Report:	Computer Models
June 11:	Draft report transmitted to reviewer
July 2:	Reviewer's written analysis deliver deadline to RSALOP
Task 3 and Task 5 Reports:	Inputs and Assumptions and Independent Calculation
August 13:	Draft reports transmitted to reviewer
September 10:	Reviewer's written analysis delivery deadline to RSALOP

As stated above, the RSALOP has established an honorarium for timely completion of the written analyses. RSALOP, through RFCAB, will award a maximum $2,000 honorarium as follows:

Task 6 and Task 2 Reports: A full honorarium amount of $500 for each report will be awarded if the written analysis is delivered by the deadlines outlined above. Written analyses received up to seven days past the delivery deadline will result in a decreased award of $400 per report. Analyses received eight to fourteen days past the delivery deadline will result in a decreased award of $250 per report. No honorarium will be awarded for analyses received more than fourteen days past the delivery deadline.

Task 3 and Task 5 Reports: Because of the interrelationship between these two reports, they will be combined for review purposes. A full honorarium amount of $1,000 will be awarded for delivery of the written analyses by the stated deadline. The honorarium will be reduced to $800 for analyses received up to seven days late. A further reduction of the honorarium to $500 will awarded to analyses received eight to fourteen days past the deadline. No honorarium will be awarded for analyses received more than fourteen days past the deadline.

By the signatures below, the parties acknowledge concurrence with this agreement.

_____ Date: _____

James A. Kinsinger
Chair

_____ Date: _____

Dr. X.

DRAFT

152

Letter of Agreement

The Rocky Flats Citizens Advisory Board (RFCAB) serves as the funds manager for the Radionuclide Soil Action Levels Oversight Panel project and related peer review process. This letter outlines the agreement between the RFCAB and Dr. X (hereafter referred to as the reviewer) towards the conduct of peer review for the Radionuclide Soil Action Levels Oversight Panel (RSALOP). The RSALOP will deliver to the reviewer four draft reports prepared by the contractor, *Risk Assessment Corporation*, as part of its work in conducting an independent assessment of the radionuclide soil action levels developed for the cleanup of the Rocky Flats Environmental Technology Site. The reviewer will assess these draft reports and prepare a written analysis for submission to the RSALOP. For timely completion of the written analyses, the RSALOP, through RFCAB, will award an honorarium, plus reimbursement for costs (e.g., phone calls, faxes, delivery services) associated with the conduct of the review. The reviewer understands that full award of the honorarium is dependent upon completion and delivery of his or her written analysis within the prescribed deadlines as outlined below:

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James A. Kinsinger
Chair

Date: 19 Apr 99

Allan C. B. Richardson

Date: April 7, 1999

153

February 25, 1999

Mr. Allan C. B. Richardson
[redacted]

Dear Mr. Richardson:

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

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Sincerely,

Hank Stovall

Hank Stovall, Co-Chair

Mary Harlow

Mary Harlow, Co-Chair

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

154

January 27, 1999

Mr. Allan C. B. Richardson

[redacted]

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An honorarium has been established for your work. A maximum of $2,000 will be awarded to each reviewer who completes his/her work within the scheduled timeframe. Because of the necessity to complete the independent assessment on schedule, it is vital that the Peer Review be conducted in a timely manner. Therefore, a sliding honorarium scale has been developed:

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- Because of the need for *RAC* to submit its final reports on schedule, late analyses will severely impact the work schedule. It is hoped that each Peer Reviewer will strive to work within the deadlines to the maximum benefit of this important assessment. To that end, analyses received before deadlines will be greatly appreciated.
- Besides the honorarium, expenses incurred by the reviewers will be reimbursed for items such as long distance phone calls, copying, faxes and delivery services. Each reviewer will submit an invoice specifying these reimbursable costs upon completion of each review task.

To help answer any of your questions and to allow you to speak with the Co-Chairs and other interested Panel members before the review process starts, a conference call will be scheduled for early March. You will be contacted before that time to determine your availability.

Finally, a letter of agreement between yourself and the Rocky Flats Citizens Advisory Board, the organization which is managing the funds for the independent assessment, will need to be signed. This letter stipulates the analysis report deadlines and the honorarium agreement. A draft copy of the letter is enclosed for your review. Some details regarding dates and deadlines may be changed in the final copy of this letter. Hence, the final copy will be transmitted for your signature following the March conference call and before delivery of the first task report.

The Panel genuinely appreciates your willingness to take on this important task. If you agree to undertake this work, please contact the project administrator, Carla Sanda at (303) 277-0753 by February 5, 1999. If you have any questions about the project, please contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Original Signed By
Hank Stovall, Co-Chair

Original Signed By
Mary Harlow, Co-Chair

Enclosure:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RFSALOP Members

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Letter of Agreement

The Rocky Flats Citizens Advisory Board (RFCAB) serves as the funds manager for the Radionuclide Soil Action Levels Oversight Panel project and related peer review process. This letter outlines the agreement between the RFCAB and Dr. X (hereafter referred to as the reviewer) towards the conduct of peer review for the Radionuclide Soil Action Levels Oversight Panel (RSALOP). The RSALOP will deliver to the reviewer four draft reports prepared by the contractor, *Risk Assessment Corporation*, as part of its work in conducting an independent assessment of the radionuclide soil action levels developed for the cleanup of the Rocky Flats Environmental Technology Site. The reviewer will assess these draft reports and prepare a written analysis for submission to the RSALOP. For timely completion of the written analyses, the RSALOP, through RFCAB, will award an honorarium, plus reimbursement for costs (e.g., phone calls, faxes, delivery services) associated with the conduct of the review. The reviewer understands that full award of the honorarium is dependent upon completion and delivery of his or her written analysis within the prescribed deadlines as outlined below:

Task 2 Report: **Computer Models**
- March 12: Draft report transmitted to reviewer
- April 2: Reviewer's written analysis delivery deadline to RSALOP

Task 6 Report: **Soil Sampling Protocols**
- May 14: Draft report transmitted to reviewer
- June 4: Reviewer's written analysis delivery deadline to RSALOP

Task 3 Report: **Inputs and Assumptions**
- July 9: Draft report transmitted to reviewer
- July 30: Reviewer's written analysis delivery deadline to RSALOP

Task 5 Report: **Independent Calculation**
- September 10: Draft reports transmitted to reviewer
- October 1: Reviewer's written analysis delivery deadline to RSALOP

As stated above, the RSALOP has established an honorarium for timely completion of the written analyses. RSALOP, through RFCAB, will award a maximum $2,000 honorarium as follows:

A full honorarium amount of $500 for each report will be awarded if the written analysis is delivered by the deadlines outlined above. Written analyses received up to seven days past the delivery deadline will result in a decreased award of $400 per report. Analyses received eight to fourteen days past the delivery deadline will result in a decreased award of $250 per report. No honorarium will be awarded for analyses received more than fourteen days past the delivery deadline. If reports are delivered to me later than the above dates, I reserve an equal number of days to return the review and still expect full compensation

By the signatures below, the parties acknowledge concurrence with this agreement.

James A. Kinsinger
Chair

Date: 1 Apr 99

Steven L. Simon

Date: 3/8/99

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Steven L. Simon, PhD

14 March, 1999

Mr. James A. Kinsinger
AIMSI
5460 Ward Road, Suite 370
Arvada, CO 80002

Dear Mr. Kinsinger,

Please find enclosed my signed letter of agreement to serve on the RSALOP Peer Review Team. Also please note my proper addresses for mailings.

For weekday FEDEX delivery, please use my present workday address:

Board on Radiation Effects Research, Rm 342
National Academy of Sciences
2101 Constitution Ave., NW
Washington, DC 20418

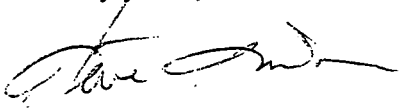
For payment for services, please use my permanent mailing address only, and please reflect this address on any necessary tax documents.

4090 Willow Springs Court
Reno, NV 89509

Also, please note that if the reports sent for my review are delivered to me later than the dates specified on the Letter of Agreement, I will reserve, if needed, an equal number of additional days to return my review to you, and still expect full compensation. If this is not agreeable, please inform me immediately.

I look forward to being of service to your committee.

Sincerely yours,



Steven L. Simon, PhD

February 25, 1999

Dr. Steven L. Simon
Board of Radiation Effects Research
National Academy of Sciences
2101 Constitution Ave., NW
Washington, DC 20418

Dear Dr. Simon:

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

Enclosed is the final Letter of Agreement that will be discussed in our upcoming conference call. You will note that review dates have changed for the tasks since our original mailing. We sincerely hope this will not adversely impact your schedule.

To provide you with additional background information on the project, we are also enclosing the following:

- Section IV - Project Description and Scope -- an excerpt from the original Request for Proposals that was issued on the project to prospective technical contractors.
- Proposal of Work - an excerpt from the winning proposal from Risk Assessment Corporation on the project
- Fact sheet entitled *"Planning for Tomorrow...Radionuclide Soil Action Levels at Rocky Flats"*

We look forward to talking with each of you at the conference call scheduled for: Monday, March 8, 1999 at 9:30 a.m. (Mountain Standard Time). You may connect to the call by dialing ***1-800-403-2004***. When asked for the "participant code", please enter ***392779***. Thank you again for your willingness to take on this important task. If you have any questions prior to the conference call, please feel free to contact either of us. Mary Harlow may be reached at (303) 430-2400 ext. 2174, while Hank Stovall can be reached at (303) 466-5986.

Sincerely,

Hank Stovall
Hank Stovall, Co-Chair

Mary Harlow
Mary Harlow, Co-Chair

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

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January 27, 1999

Dr. Steven L. Simon
Board of Radiation Effects Research
National Academy of Sciences
2101 Constitution Ave., NW
Washington, DC 20418

Dear Dr. Simon:

The Rocky Flats Soil Action Levels Oversight Panel ("the Panel") has selected you to serve as a Peer Reviewer for the independent scientific review of the radionuclide soil action levels (RSALs) that were set by the Department of Energy, Environmental Protection Agency, and the Colorado Department of Health & Environment for the cleanup of the Rocky Flats Environmental Technology Site. The Panel has selected five peer reviewers reflecting a variety of backgrounds relevant to the Rocky Flats study.

The Panel was formed in 1998 as a citizen oversight panel and has hired Risk Assessment Corporation to provide the scientific review of the process and methodologies used to set the RSALs for Rocky Flats. Work began in October 1998 and is scheduled for completion November 1999. The scientific review involves various work tasks, for which *RAC* will produce separate written reports. The Panel has determined that four of these draft task reports are candidates for peer review. (Note: A copy of the original Request for Proposals and the proposal submitted by *RAC* will be sent under separate cover to provide you with additional information on the project.)

The Panel has developed the following process for timely conduct of the peer review:

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Sincerely,

Original Signed By
Hank Stovall, Co-Chair

Original Signed By
Mary Harlow, Co-Chair

Enclosure:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RFSALOP Members

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DRAFT

Letter of Agreement

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Task 6 Report:	Soil Sampling
April 9:	Draft report transmitted to reviewer
April 30:	Reviewer's written analysis delivery deadline to RSALOP
Task 2 Report:	Computer Models
June 11:	Draft report transmitted to reviewer
July 2:	Reviewer's written analysis deliver deadline to RSALOP
Task 3 and Task 5 Reports:	Inputs and Assumptions and Independent Calculation
August 13:	Draft reports transmitted to reviewer
September 10:	Reviewer's written analysis delivery deadline to RSALOP

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As stated above, the RSALOP has established an honorarium for timely completion of the written analyses. RSALOP, through RFCAB, will award a maximum $2,000 honorarium as follows:

Task 6 and Task 2 Reports: A full honorarium amount of $500 for each report will be awarded if the written analysis is delivered by the deadlines outlined above. Written analyses received up to seven days past the delivery deadline will result in a decreased award of $400 per report. Analyses received eight to fourteen days past the delivery deadline will result in a decreased award of $250 per report. No honorarium will be awarded for analyses received more than fourteen days past the delivery deadline.

Task 3 and Task 5 Reports: Because of the interrelationship between these two reports, they will be combined for review purposes. A full honorarium amount of $1,000 will be awarded for delivery of the written analyses by the stated deadline. The honorarium will be reduced to $800 for analyses received up to seven days late. A further reduction of the honorarium to $500 will awarded to analyses received eight to fourteen days past the deadline. No honorarium will be awarded for analyses received more than fourteen days past the deadline.

By the signatures below, the parties acknowledge concurrence with this agreement.

_____ Date: _____

James A. Kinsinger
Chair

_____ Date: _____

Dr. X.

DRAFT

162

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James R. Kinsinger Date: 1 Apr 99

James A. Kinsinger
Chair

F. Ward Whicker Date: 3/8/99

Dr. F. Ward Whicker

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February 25, 1999

Dr. F. Ward Whicker
Department of Radiological Health Sciences
Colorado State University
Fort Collins, CO 80523-1673

Dear Dr. Whicker:

Thank you for your willingness to serve on the Radionuclide Soil Action Levels Oversight Panel Peer Review Team.

Enclosed is the final Letter of Agreement that will be discussed in our upcoming conference call. You will note that review dates have changed for the tasks since our original mailing. We sincerely hope this will not adversely impact your schedule.

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Sincerely,

Hank Stovall, Co-Chair

Mary Harlow, Co-Chair

Enclosures:
As Stated

Cc: Jesse Roberson, DOE-RFFO
RSALOP Members

164

January 27, 1999

Dr. F. Ward Whicker
Department of Radiological Health Sciences
Colorado State University
Fort Collins, CO 80523-1673

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Hank Stovall, Co-Chair

Original Signed By
Mary Harlow, Co-Chair

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As Stated

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RFSALOP Members

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